- Animal adhesives
- Instrument air supply
- Progress in forest genetics
- New continuous pulping method

The Paper Industry

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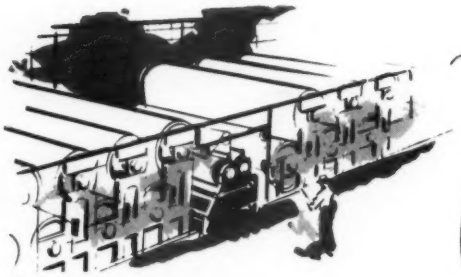
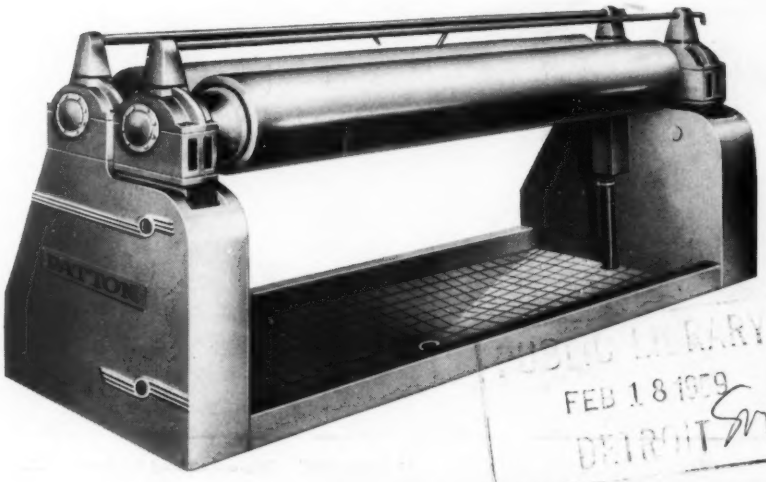


HORIZONTAL SIZE PRESSES



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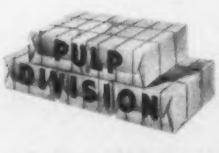

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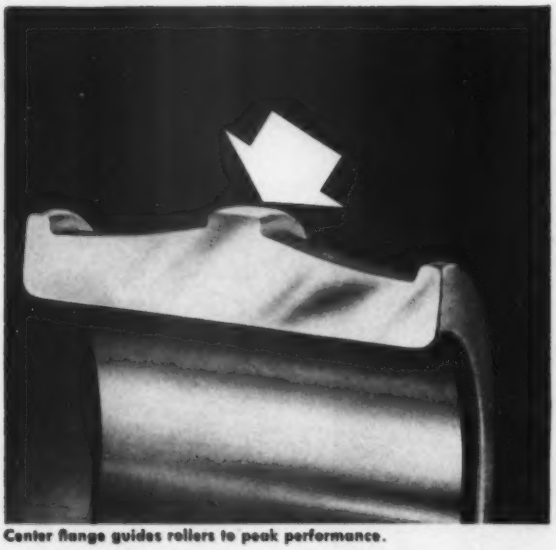

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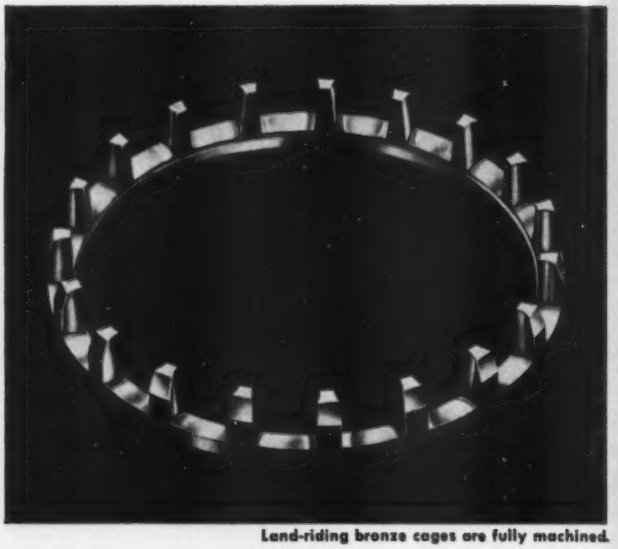

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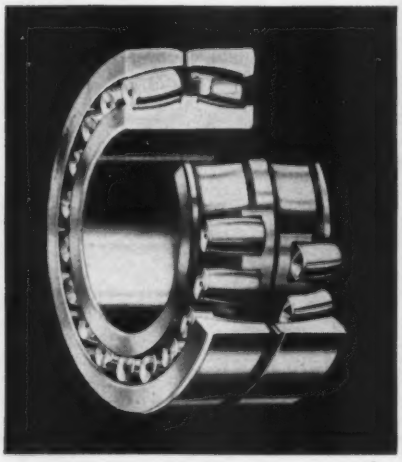
Roller diameters are matched electronically within .0001".



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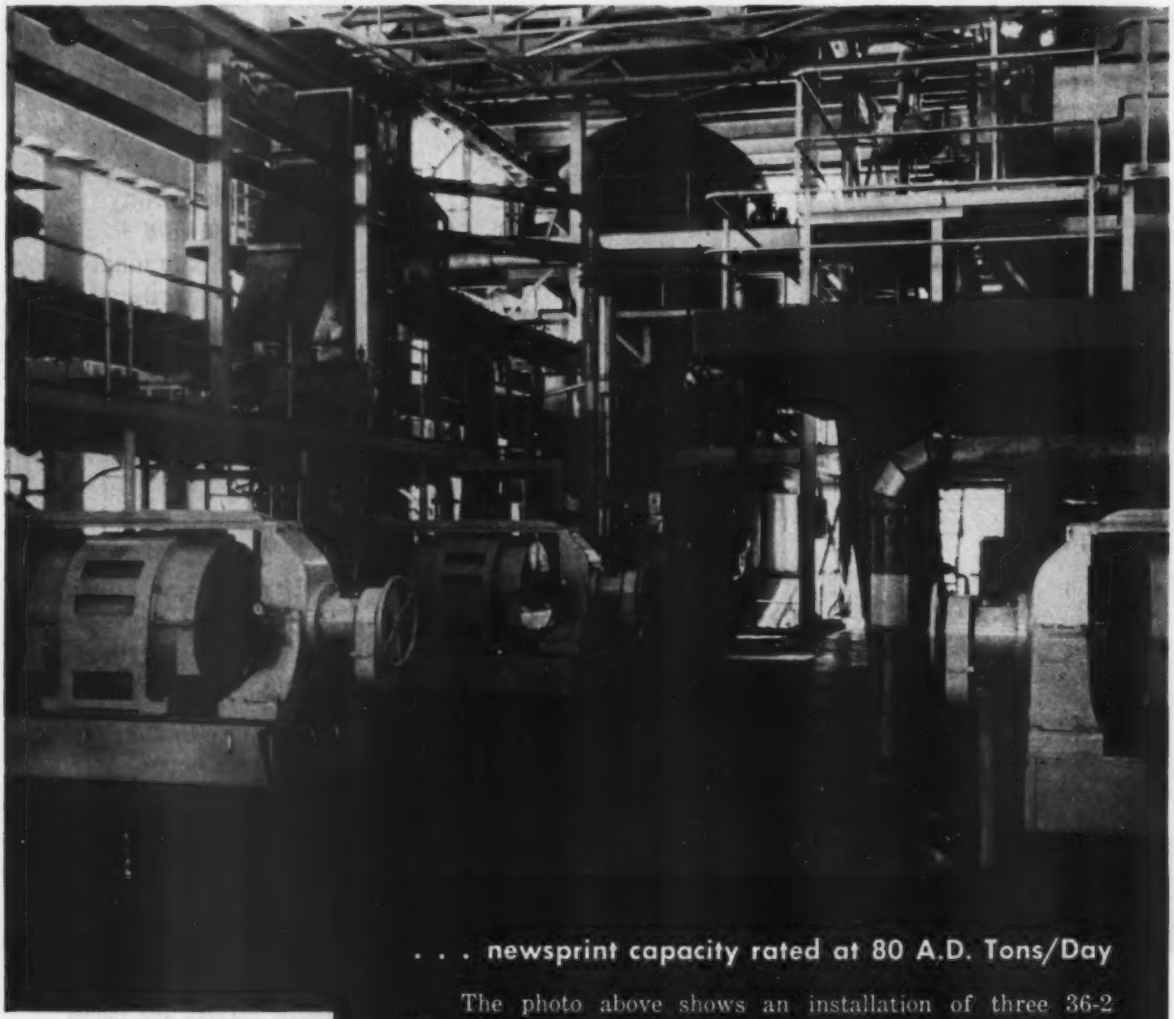

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Features . . .

Editorial — How to prolong fourdrinier wire life 719

Whither? — Savings resulting from the installation of bark burning equipment — A third press on a pulp machine — Spent sulfite liquor—a source of food for free swimming oyster larvae — Advantages of chemical felt conditioning .. 792

Adhesives in the paper industry: Part IV 730

Progress in forest genetics 733
by Bruce J. Zobel

Instrument air supply for pneumatic process control 734
by Leo Walter

All-directional stretch paper-base materials 737

Standard cost accounting for paper mills 738
by Edward W. Rodgers

New continuous cold soda pulping system 739

New finishing machine inspects sheets, sorts and piles paper in one continuous operation 741

45th annual meeting of the technical section of the Canadian Pulp and Paper Association 743

Supercalendering newsprint 754

Recent expansions in the industry 756

Pipe, fittings, valves and pumps —

The author of the series has found it necessary, due to unforeseen difficulties, to delay publication of these articles until May, 1959.

In response to the many inquiries from our readers who missed the continuation of these articles in the January issue, we can definitely state that the series will be resumed — at the author's high standard of quality — in the May issue.

News . . .

News of the Industry 754
Names in the News 763
Necrology 790
Safety 766

Departments . . .

Current Comments 749
Coming Events 768
Patent Reviews 770
Foreign Abstracts 775
New Products 777
New Literature 785
Market Quotations 789
Index to Advertisers 791

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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From our point of view..

How to prolong fourdrinier wire life

THE TECHNICAL Section of the Canadian Pulp and Paper Association is to be complimented on the thoroughness of the investigation made by its Task Force appointed in 1956 for the purpose of studying the causes for the short fourdrinier wire life.

When one considers the expenditure of $3000 involved in a single fourdrinier wire change and the frequency of such changes on a modern newsprint machine — currently requiring a minimum of about 60 wire changes per annum — it is not difficult to see why this topic was the subject of an all-day session of the CPPA's Technical Section. (see page 743 in this issue).

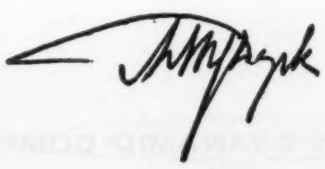
The results of this study show that the factors affecting wire wear and wire damage are those that play the most decisive parts in wire life and that corrosion cannot be too important a factor in the relatively short span of a wire's life.

The greatest point of wear, according to the Task Force's findings, is at the suction boxes of a modern newsprint fourdrinier, where rubbing between the wire and the boxes takes place under conditions of vacuum and at full wire speed. Tensions measured between the suction boxes and the couch amount to 33 lb./in. for new wires and 35 lb./in. for old wires.

To reduce wear at the suction boxes, the Task Force suggests the removal of the last suction box (which operates under highest vacuum) allowing the couch to remove more water wherever possible. A larger number of table rolls should also be considered to increase the water removing capacity in the forming area of the wire. Another approach to reducing the drag load at the suction boxes would involve a change of suction box design or the use of new construction materials that would result in less friction between the boxes and the wire.

Where it concerns the question of wire damage, stock jams at the first outside wire return roll constitute the greatest danger to the wire. On a pick-up machine, stock jams can be prevented by the use of a knock-off shower system which is turned on automatically during a sheet break. This system is already in use in one Canadian mill. For an open-draw machine a partial solution may lie in decreasing the angle of wrap and increasing the size of the return roll, while the eventual solution may have to await the development of a specially designed knock-off shower.

The findings of the Technical Section's Task Force shed new light on the important problem of fourdrinier wire life and will enable many paper mills to introduce changes that will result in appreciable savings resulting from a marked prolongation of wire life.



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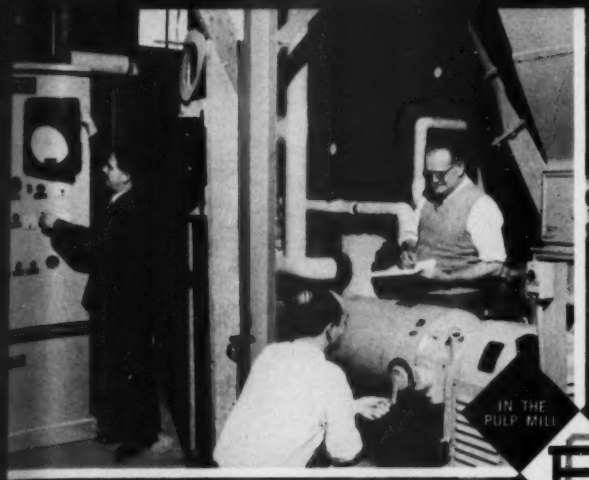

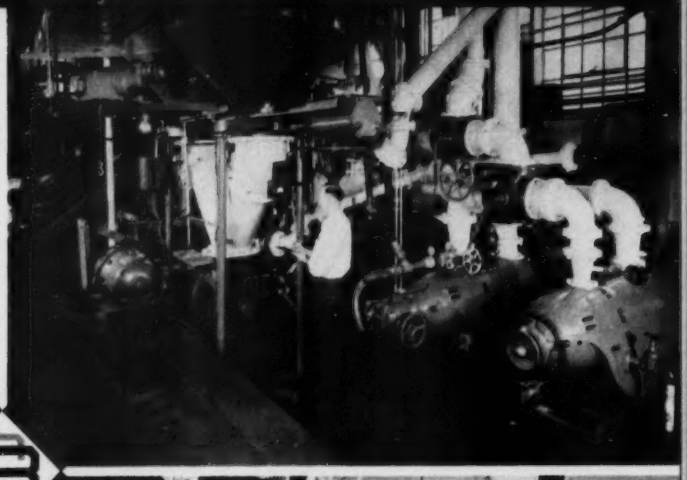

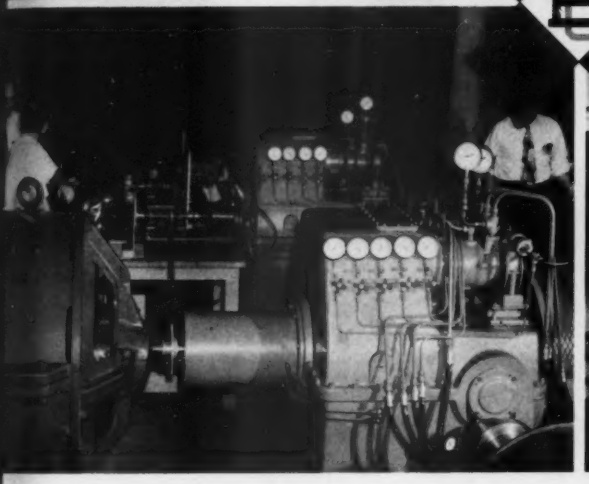

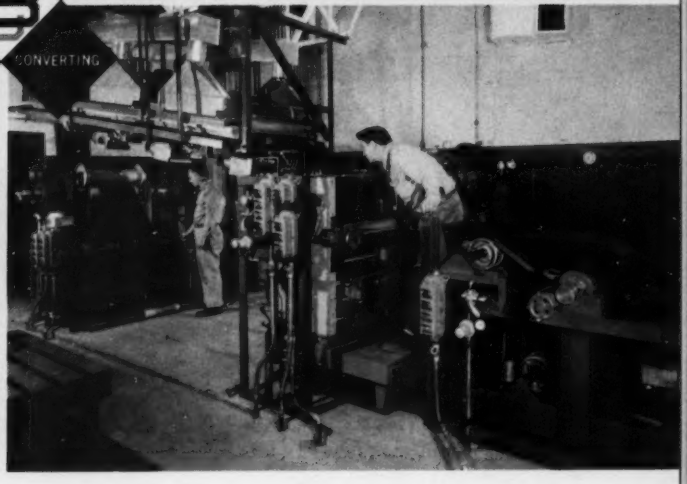

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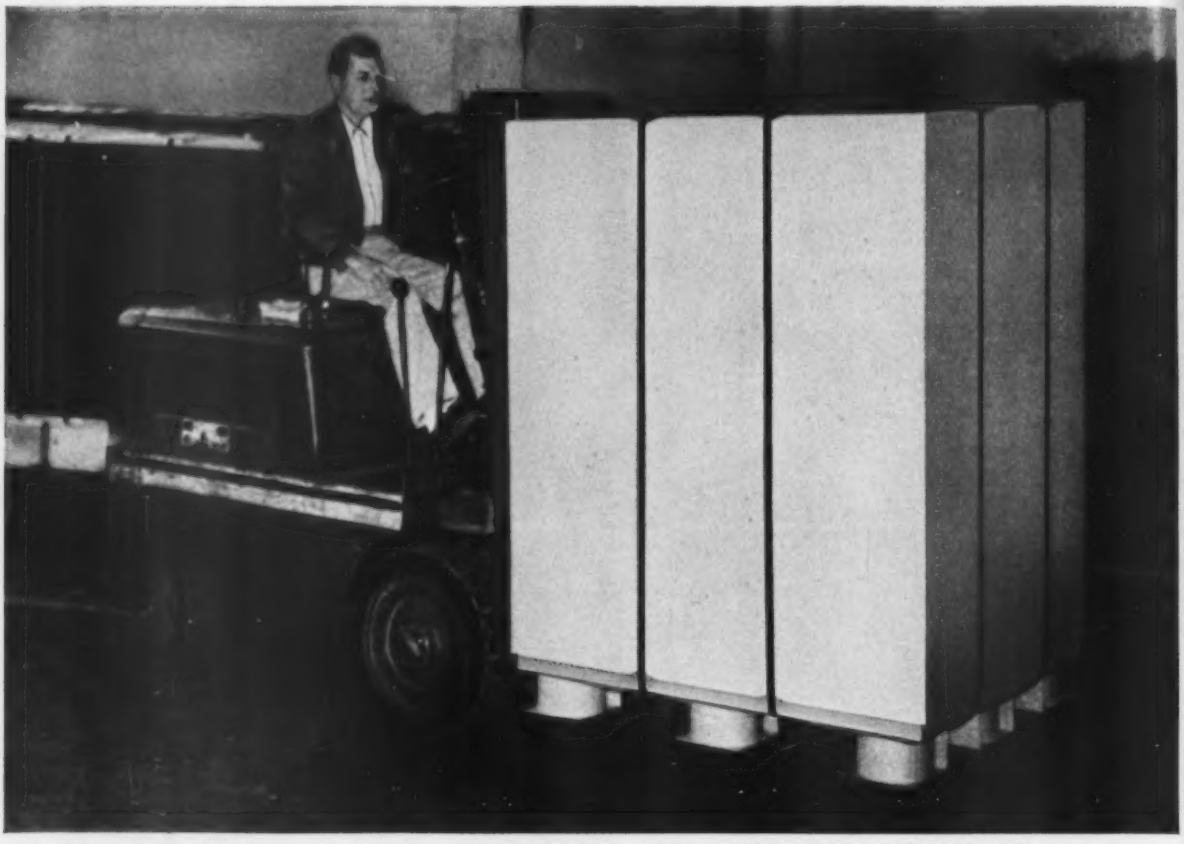

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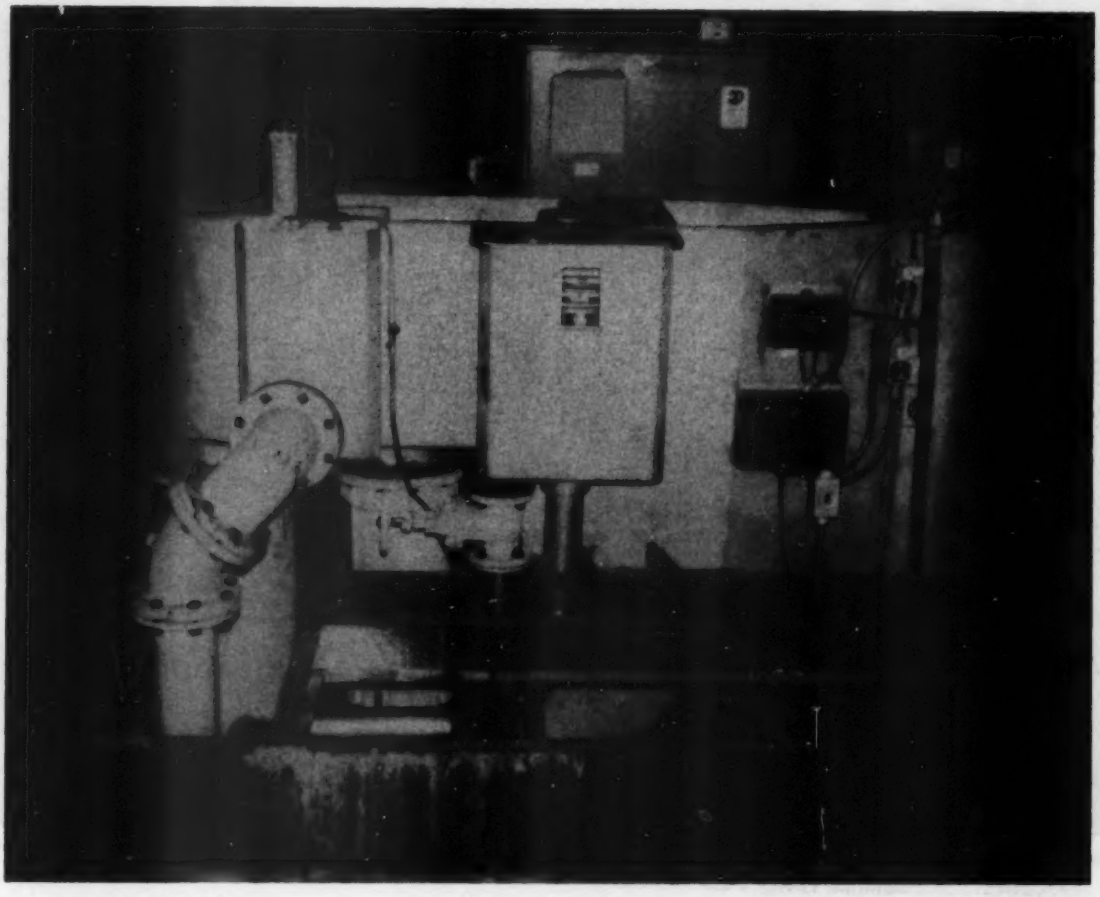

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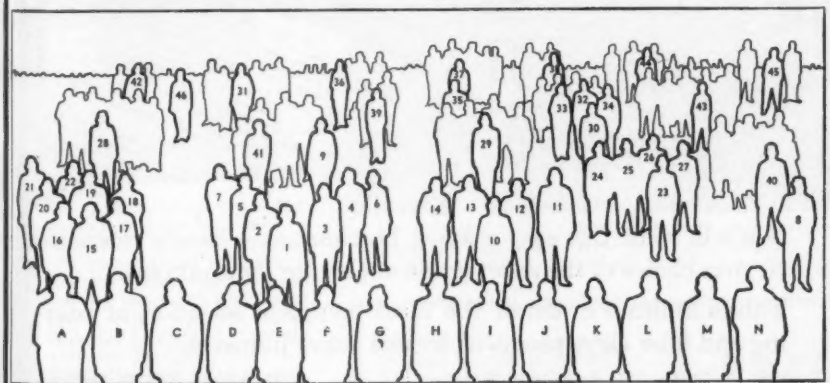

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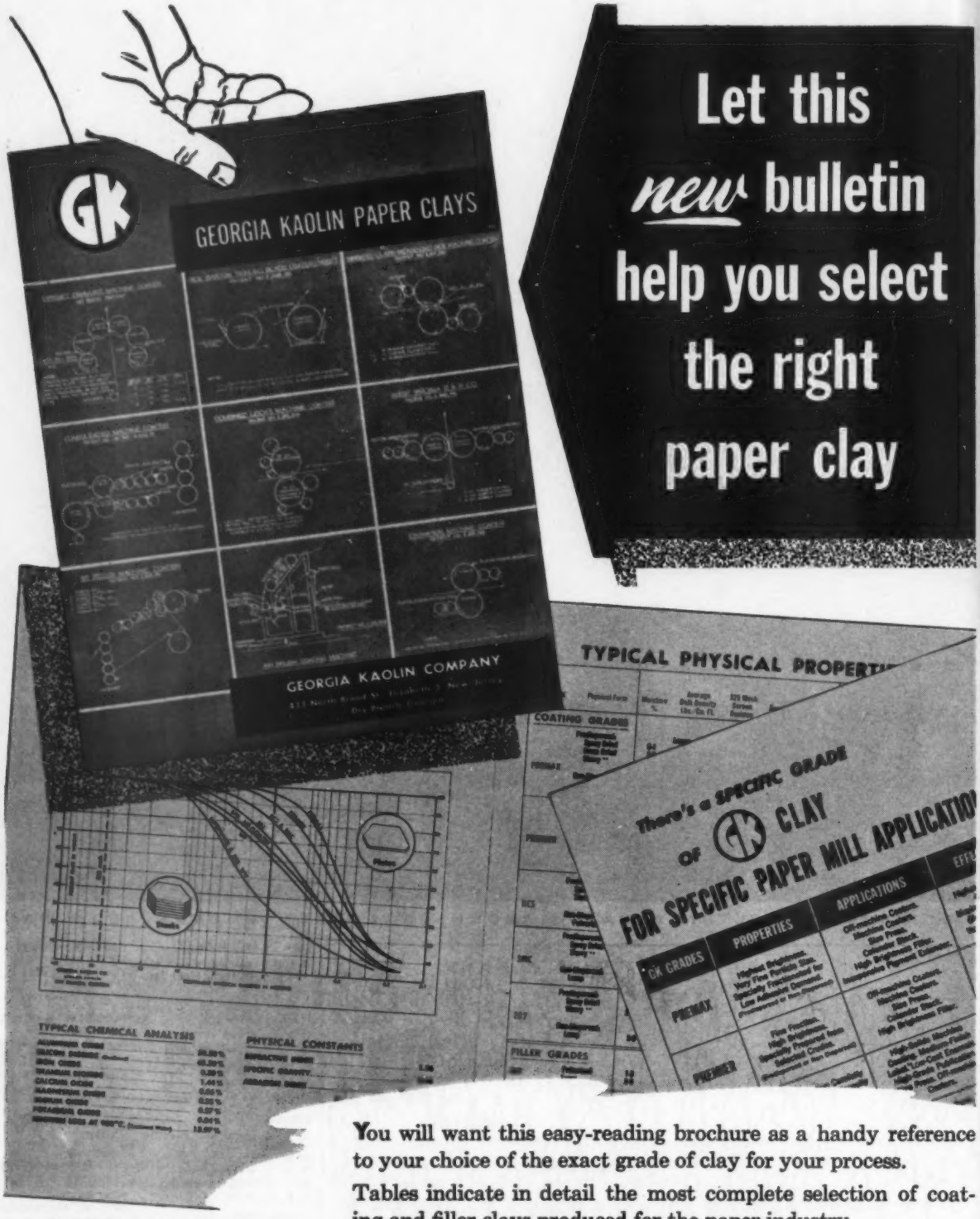

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Broad wear-surfaces of C-132 chain cut replacement costs in pulpwood handling

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Rugged Link-Belt chain withstands punishing impact, abrasive abuse

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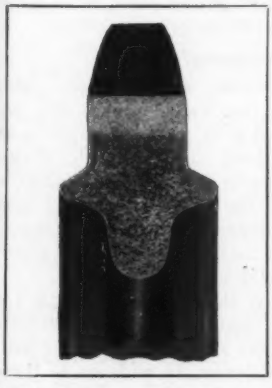
C-132 center links are simple, rigid and rugged castings. Sidebars are made from selected steel. Steel connecting pins are locked in the sidebars . . . only center links, which have generous bearing area, rotate on the pins.

Many center link and sidebar attachments are available for Link-Belt C-132 chain. Coupler links, which permit assembling the chain in odd pitch lengths, can also be supplied.



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In manufacturing Flint-Rim sprockets, Link-Belt uses a high-grade, fine-grain, alloyed cast iron—chilled to impart a file-hard surface on the teeth and root diameters where contact is made with the chain. This hard surface, together with the fine pitch accuracy attained in this form of casting, maintains efficient, dependable performance of chain and sprockets . . . prolongs chain life.

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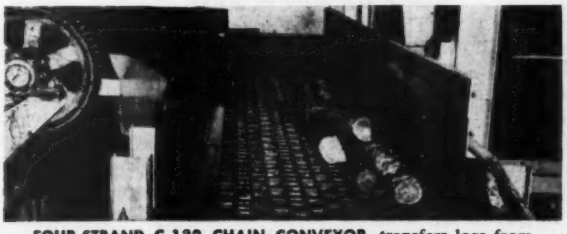
Popularity of C class chain is due to versatility as well as high strength and durability. Cast center links and steel sidebars form an inexpensive medium for both elevating and conveying. And if you have extra-severe needs, C class chain can be tailored to meet them exactly. For example, center links are available in Promal and file-hard Promal as well as malleable iron. Specially treated joints and special hardening in localized areas give greater wear life. Also, a wide variety of attachments adds to application flexibility.



FOUR-STRAND C-132 CHAIN CONVEYOR transfers logs from jackladder and slasher table to distributing chain conveyor at this mill. Chain is equipped with F-27 attachments.

K-9 ATTACHMENT on this C-132 chain supplies additional broad sliding surface.

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Adhesives in the paper industry

Part IV — Animal-based adhesives

▶ It is estimated that some 60,000,000 lbs. of animal glue are used annually by the paper industry. They are used in such applications as packaging, paper coatings, retention and flocculation of fiber and filler.

FOLLOWING the classification described in Table III, this review will now discuss the chemistry of the various types of adhesives. Particular emphasis will be placed on those which are important to the packaging industry. Traditionally, these are the animal-, vegetable- and mineral-type adhesives. In the past decade, however, the resin types, particularly resin emulsions, have found an important place in the packaging industry. The resin adhesives will undoubtedly become more important as the need for special performance becomes paramount.

Animal glues

Animal-based adhesives, as indicated above, include bone and hide glues, fish glues, soluble dried blood, blood albumin and casein. Of these, the bone and hide glues and the casein adhesives are the most important for the packaging industry. The animal glues are soluble or miscible with water; and, as might be expected, they are insoluble in classic organic solvents, but soluble in carbamide, ethylene chlorhydrin, and ammonium thiocyante. They have a slightly acid pH and can demonstrate good adhesion especially on paper stocks. Their dried films exhibit good strength.

The principal uses of animal glues today in papermaking are surface and internal sizing, retention and paper stock recovery (which is achieved by chemical flocculation), and also for raw and waste water treatment.

In addition they are used in paper coatings as an adhesive to bond the pigment to the base paper stock; for coating of gummed tape; sealing of jumbo rolls that come off the winders; for gummed labels; for set-up and folding box manufacture, book production, tube winding, etc.

The physical forms of the animal glue adhesives and their uses have been described in the Modern Packaging Encyclopedia (Reference 8, p 320). Here they are broken into four categories, including non-warps, flexibles, glue jellies and liquefied animal glues.

Non-warp animal glues

The non-warps are supplied as dry mixtures, jellies or as cakes or slabs. The solid materials originally contain approximately 10-13 per cent moisture. The concentrated cake form has about 25 per cent moisture, whereas the jelly contains approximately 50 per cent moisture. For use they must be dissolved or melted and applied at approximately 140° F. The films lay flat but are not necessarily flexible. Tack is good, and properties such as drying range and setting speed are adjusted by formulation. If the tack range is long with slow setting speed, they are employed as bench or table glues. Most of these are light in color and have strong "chewing gum" tack. They are used in the manufacture of hard-side suit cases, for lay-flat mounting and laminating, for the tight-wrapping and stripping of set-up boxes and for the hard-side case making for books. Although non-warp glues are not strictly flexible, they have adequate flexibility for the finished product and provide adequately flat surfaces for such items as candy or hat boxes.

Flexible animal glues

The flexible animal glues differ from the non-warps in that they are formulated with enough plasticizers so that the dried film is flexible. Plasticizers present provide for moisture retention. The glue present gives them a high degree of grease resistance, while the moisture held by the plasticizer provides toughness.

Actually, the basic ingredients for both the non-warp and the flexible animal glues are the glue itself, plasticizers and water. In addition to these ingredients, however, defoamers, tackifiers, colorants, preservatives and perfumes may be included.

Glues may be insolubilized in water by treatment with cross-linking agents such as formaldehyde. The gasket and crown cork industries make use of such mechanism for insolubilizing glue.

Many printers rollers are made from glue, glycerine, water, and tanning agents, since the insolubilized composition provides the properties desired for high-speed types of printing.

The animal glue content of flexible glues may vary from 15-65 per cent. The plasticizers or humectants which are included may consist of glycerol,

sorbitol, various glycols, lactic acid salts or sugars. Low cost formulations such as those used for covering paper boxes contain large quantities of sugar, invert syrup or glucose. However, very high glucose concentrations must be avoided since glucose, as a reducing sugar, tends to tan or insolubilize animal glue. If sodium bisulfite is included, the reaction between the aldehyde group of the sugar and the protein can be retarded. Glycerol or sorbitol are preferred plasticizers where the glues are to be subjected to long heating periods.

The flexible glues are formulated for either fast or slow setting as required for either machine or hand operations. Their applications include box and luggage uses where flexibility is important. They also may be used as greaseproof coatings or linings in many types of paper containers.

Glue jellies

The glue jellies are animal glues that have been dissolved in water and formulated with preservative and antifoamer and cooled to a firm jelly at normal room temperature. This liquefies when mild heat is applied. Usually, these products are neither flexible nor non-warp. They are used primarily for setting up shoe boxes.

Liquefied animal glues

Liquefied animal glues are formulated so that they are fluid at room temperature. As such, they may be applied without heat.

Among the additives which effect this liquefaction are urea, thiourea, ammonium thiocyanate, sodium β-napthalenesulfonate or the chlorides or nitrates of calcium, magnesium and zinc. The normal ratio of ingredients in such glues are 40 per cent glue and 10-20 per cent of liquefier dissolved in water. Beyond this, the properties vary widely depending on the end use. For example, the so-called ice-proof gums gel in cold water so that they will hold labels on bottles immersed in water. Others are formulated to serve as remoistening gums. "Stringing" and "cottoning", which are typical properties of liquefied animal glues, may be prevented by formulation, particularly where machine application is intended. In addition to the applications already mentioned, these glues are used for wood and as makeready adhesives in folding box plants.

A specialized type of glue is known as opaque glue. This is made by adding titanium or zinc oxide, wetted with glycerine, to a glue solution prior to drying. Such a product may be used wherever a white pigmented glue line is desirable, as in picture frames.

Chemistry and properties of animal glue

Chemically, animal glue, as well as fish glue, is an adhesive derived from collagen—a protein found in the connective tissues of animal and fish and particularly in hide, skin, sinew and in the protein portion of bone (2). The chemistry of collagen remains complex, even though its use as an adhesive goes back to ancient times.

Animal glue is a water-dispersible protein, absorbing water and forming an elastic gel which melts at relatively low temperatures to form a solution with adhesive properties. The tendency of animal glue to form an elastic gel is its most characteristic property. In the formulation of glue, it is frequently desirable to prevent this gelling tendency or to "liquefy" the glue. This may be done by the addition of certain salts, such as chlorides and nitrates of the alkaline-earth metals. Organic compounds such as urea also make animal glue non-gelling.

Animal glue or gelatin in the dry state is stable indefinitely. When in solution it hydrolyzes, from the standpoint of reduction of gel strength at a rate depending upon concentration of solution, pH, and temperature.

The lowest rate of hydrolysis occurs at pH 6.2, though there is little change in rate between 4.5 and 8 pH. This is known as the isoelectric range, within which most commercial processes are carried out.

The rate of hydrolysis doubles for every rise of 10° C, which illustrates that temperatures, higher than the classic 140° F, can be used in commercial processes providing the time is controlled. Molds, bacteria, and certain enzymes also break the peptide linkages and destroy the adhesive properties of animal glue.

Hide glues have moisture contents of about 12 per cent, ash contents of 2-4.5 per cent, and a pH range of 6.4-7.4. Bone glues are slightly more acidic, with a pH range of 5.4-6.2.

Animal glues when placed in cold water swell to a spongy mass of jelly-like particles. Upon gentle heating this spongy mass becomes liquid forming hydrophilic sols.

Upon cooling, animal glue solutions set to a jelly that readily reverts to a liquid solution upon application of heat.

One of their important characteristics is their film-forming property. These films when dry are insoluble in oils, alcohols and non-aqueous liquids. They are continuous and of considerable strength and elasticity.

Animal glues carry a negative electrostatic charge. As amphoteric colloids, however, they are capable of combining with either anions or cations, depending upon the hydrogen ion concentration of the medium.

Animal glues are evaluated on the basis of comparative gel strengths and viscosity characteristics. Gel strength in grams is the weight required to depress a standardized plunger into the chilled glue to a specified depth.

Gel strengths of animal glues range from 20 gr. (for weak glues) to 600 + gr. (for exceptionally strong glues.) Viscosities range from 20-300 millipoises.

The animal glues are cured or made more water-resistant by tanning agents. Among the tanning agents which insolubilize glue are: formaldehyde, acetaldehyde, reducing sugars and soluble salts of trivalent iron, chromium and aluminum. Once treated in this manner, glue will not dissolve in water but it will absorb water to form gels that do not melt on heating.

Manufacture of glues

The manufacture of hide glue (2) is a relatively simple matter. It involves, first of all, thorough washing of the raw stock from which the glue is to be extracted. Thereafter, the raw material is "cured" in order to convert the collagen into a hot-water extractable form, which is essentially hide glue. The curing is carried out in vats or pits. Here, the material is treated with a saturated solution of lime at a minimum pH of 12. Soda ash may be included in cold weather in order to help the penetration of the alkali. This curing period varies from four to ten weeks depending on the temperature and type of stock. It should be pointed out, however, that there are certain stocks, such as shredded rabbit skins from the felting industry and bacon rinds that cure in a few hours if soaked in dilute mineral acids at pH's of one to three.

When completely cured, the raw material has swelled considerably and is alkaline throughout. Thereafter, it is washed to remove the excess lime and any non-collagen matter, such as mucin, which is present. Hydrochloric acid is added to neutralize residual lime, forming a water soluble salt which is easily removed. It is then agitated with sulfurous acid, which serves to bleach the glue. Thereafter, the raw material is again washed with water until a neutral pH results.

The glue may now be extracted from the cured animal parts by heating with water at 140°-212° F. in a

large vat. After several hours, the liquor is removed and becomes "first run" liquor. More water is added and the temperature is raised ten degrees to obtain "second run" liquor. This is continued for several runs until the liquors are so dilute that further extraction is not justifiable. In these runs, the temperature is never raised above 210° F., except in the last cook, since boiling would provide undesirable agitation which would emulsify the grease present. As might be expected, the first run liquors provide the least hydrolyzed glues and, accordingly, are of the highest test.

During the cooking process, the grease or tallow collects at the top of the kettle and is removed by skimming or centrifuging. The surface of the various liquors in holding tanks must also be skimmed to remove fat. These extraction liquors have glue solids contents of one to six per cent. These are known as the "light liquors" in contrast to "heavy liquors" which are produced later by evaporation. The light liquors must be handled very promptly in order to prevent bacterial action. If preservatives are to be used, chlorophenates and/or zinc sulfate may be included.

The light liquors are concentrated under vacuum to a solids content of 8-18 per cent if they are from the early runs and provide the necessary viscosity at this solids content. The latter run liquors may be concentrated to 20-50 per cent solids. In any case, the viscosity of the glue is the final criterion on which solids concentration is based.

Also, the light liquors may be bleached to a greater extent than was possible with the sulfurous acid by the addition of hydrogen peroxide, sulfur dioxide or sodium hydrosulfite.

Defoaming agents may be added, particularly if the glues are to be applied by mechanical rollers. Fat is frequently added for defoaming although it has the disadvantage of providing minute grease spots at the point of glue application. Specialized defoamers, which are not fatty in character, are now available.

At this point, the glue must be dried. Five commercial processes are available. The oldest is the tunnel process. Here the glue is gelled on an endless rubber belt by passing it through a refrigerated chamber. The jelly is then cut up and placed on wire nets in wind tunnels. Temperature is successively increased in these tunnels until the glue is dried. This may take two to four days.

The second method, the Lowry process, involves forcing the glue through cutters to form pellets which are dried in air on moving screens through zones of increasing temperatures.

In the third method, hot, concentrated glue liquor is applied on a large diameter heated roll. The partially-dried film that forms on the roll is continuously removed with a knife and refrigerated to increase its strength. It is then dried in an apron dryer. Another product known as "roll" glue is completely dried on steam-heated rolls and removed in the form of thin "flakes".

The fourth method provides what is known as Scheidemandel (smooth) pearl glue. Here, the glue solution is extruded through "droppers" in the form of beads. These fall into a tower containing chilled volatile oils. The gelled droplets of glue (pearls) are removed as small beads and are spread on porous beds to dry, first by the use of cold and then warm air.

The fifth method produces what is known as coated pearl glue. Here, the heavy liquors are extruded into drops and these drops fall onto a moving bed of dry finely ground glue. Thus, they become covered with the dry glue. Screening then separates the coated gelled glue from the dried glue. The latter is recycled, whereas the former is sent to a hot-air, continuous dryer. The resulting clusters are ground to a uniform size.

The glue obtained by these methods may be marketed in the form in which it exists, or else the products may be ground to uniform size.

A type of glue closely related to hide glue is known as chrome glue. This differs from hide glue only in the raw material source which, in this instance, is waste trimmings from chrome leather. Here, the hides have been cured and tanned. In one method of processing, the chromium salts first are removed by washing the raw material with oxalic acid. Thereafter, the operations are the same as for hide glue.

Manufacture of bone glues

In the manufacture of green bone glue, the raw materials are bones obtained from meat processing plants. The first step of the operation is to crush the bones and then wash them free of blood and dirt. The crushed bones are then pressure-cooked in order to extract the glue. Eight to fourteen such cooks may be necessary.

The liquors obtained by this extraction process are then handled as they are for hide glue to obtain the final product which is known as green bone glue.

In the manufacture of naphtha extracted bone glue, the raw material consists of dry bones which have been subjected to field blanching of originally green bone. These bones are devoid of most of their original fat and external cartilage.

The bones are crushed and extracted with naphtha to remove the grease. The degreased bones are cooked in a similar fashion to that of the green bones.

This type of glue is quite similar to hide glues of the same gel strength, in that their viscosities are at about the same level. In contrast, green bone glue has higher viscosity for a similar gel strength.

Application of animal glues in the paper industry

In addition to the use of animal glues in the packaging industry, a large quantity of these glues (i.e., hide and bone glues) is used in such applications as clarification of waste and white water, retention of fibers and filler on the wire, and the flocculation of fibers and pigments for better removal and recovery in savealls. For the purpose of fiber and filler retention, the modified glue is metered into the headbox of the paper machine just prior to the paper stock's travel over the fourdrinier wire or the cylinder mould where the floc is trapped as the sheet is formed.

In the treatment of white water for clarification a specially-prepared colloidal glue is added continuously as the white water enters the flotation-type saveall, forming a floc of suspended fibers. Air bubbles then carry these flocs to the surface where they are removed into a recovery chamber by a scraper.

A typical formula for use in flotation save-alls is as follows:

Glue	100 lbs.
Dry size	6-12 lbs.
Alum	8-10 lbs.
(or enough to produce a pH of 4.5-4.7)	
Preservative (Dowicide or Santobrite)	1 lb.
Diluted to	1200 gals.

The use of animal glue in internal and surface sizing is an extremely important application. In internal sizing, it improves toughness, density, formation, erasability and resistance to scuffing of the paper sheet. In surface sizing, it provides a protective film on the surface so that the fuzz

(Continued on page 740)

Progress in forest genetics

BRUCE J. ZOBEL*
North Carolina State College

Some juvenile-mature wood relationships have already been worked out, enabling prediction of the characters of mature trees from the characters of young trees or seedlings.

THE POSSIBILITY for widespread use of genetics in forestry has only recently been recognized. During the past seven years progress has been very rapid, so much so that in many instances the demand for practical application of genetics has surpassed the existing body of fundamental knowledge on which sound practices must be based.

A number of research organizations are now engaged in both the basic and applied phases of forest genetics. There is at present a good balance of investigative effort in which the forestry schools, the Federal and State Forest Services and private industry are all taking a part. The pulp and paper industry, especially in the South, has been a leader in sponsoring research. At present the southern industries are sponsoring programs at the University of Florida, North Carolina State College and Texas A & M College.

Although progress has been rapid beyond the highest hopes of most researchers, forest genetic investigations are still a long-term, slow undertaking. Some of the most important basic studies to date deal with ways to find short-cuts for speeding up both research and application. Methods to induce early seed production are being worked on. Already some juvenile-mature relationships, especially on wood properties, have been worked out, enabling prediction of the characters of a mature tree from the characters of the young tree or seedling. Wherever such juvenile-mature relationships can be established, the progress of forest genetics is greatly speeded up.

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Basic studies on past resistance, physiology and growth patterns are now underway. These serve as a basis for all applied research. For example, real success in determining the genetic control of wood specific gravity cannot be achieved until we understand why a tree stops producing springwood with its thin-walled tracheids and starts producing summerwood with its thicker-walled tracheids. In fact, most of the basic studies now needed, and already underway are not really forest genetics at all, but they are basic to further progress in this field.

Improvement of seed source

In the South, the greatest applied effort has been directed to improvement of seed source for planting. The initial work has largely centered on the selection of trees to be used in special seed-producing areas called seed orchards.

Seed orchards are established from the best-appearing trees to be found in the forests. These are then tested for their genetic superiority while the orchard grows. As soon as the genetic tests are completed, the genetically-poor individuals are removed from the seed orchard.

Many acres of seed orchards for the southern yellow pines have been established within the past five years. Most of the larger companies have either established, or are establishing, sufficient acreage of seed orchards to supply seeds for all their planting needs in the future. Enough slash and loblolly pine seed orchards have already been established to supply seed for production of about 300 million plantable seedlings annually, and the seed orchard acreage is expanding rapidly, both in industry and state programs.

Importance of superior trees as a seed source

Trees to be used as seed sources are variously called selected trees, plus trees, super trees, or superior trees. They are the very best available in our present forests. They may be selected for one or more outstanding characteristics—usually for a combination of several characteristics. Superiority is judged on the basis of growth rate (both in height and in diameter), limb size, straightness of bole, rapidity of natural pruning, freedom from diseases and insects and quality of wood. Such "super" trees are hard to find in the forest, but they do exist.

It should be stressed that super trees may appear to be excellent individuals, yet their real value lies in the degree to which they pass their outstanding characteristics to their offspring. This is why gentic tests are necessary to assess their value in the seed orchard. Unfortunately, as yet we know very little about heritability patterns in pines. Unquestionably, some characteristics are passed very strongly from parent to offspring, while others may be largely controlled by the environment in which the seed germinates and the tree grows. As soon as this inheritance pattern can be determined, forest genetics will take tremendous strides ahead.

No one is hunting for a "super tree, excellent in all characters, capable of growing under all conditions, with wood best suited for all products." Such trees do not exist. The forest geneticist hopes to find a tree best for the Piedmont, or for the Coastal Plain, best for North

(Continued on page 744)

Instrument air supply for pneumatic process control

LEO WALTER
Consulting Engineer

An uninterrupted and reliable supply of clean, dry, compressed air at constant pressure to the control mechanisms is prerequisite of accurate process control.

USE OF PNEUMATICALLY-OPERATED automatic control instruments in various processes increases rapidly as the introduction of continuous process demands more elaborate instrumentation. On the successful performance of pneumatic controllers for pressure, temperature, rate of flow, liquid level, fluid density, etc., to a great extent depends satisfactory plant operation.

An uninterrupted and reliable supply of clean dry compressed air at constant pressure to the control mechanisms and diaphragm control valves or damper motors is a prerequisite of accurate process control. It can safely be stated that newly-installed air supply systems usually meet the above requirements, but many older air systems meet part of the requirements only, and could be considerably improved by reconstruction. This will almost always rapidly pay for itself, because it eliminates possible interruptions of the control instrument action which causes losses in production.

An improved supply system for compressed air will also save money, because it might obviate the necessity of sending control instruments to the repair shop. The use of clean air might also eliminate the need for a service engineer to travel a long distance from the instrument makers, only to find that a minute solid dirt particle has choked the air nozzle of the controller mechanism. This trouble, which incidentally can be cured in a few minutes by blowing out the solid particles from the nozzle mouth, would not have occurred with clean air.

It should be mentioned that simply tapping an existing general supply system of compressed air in a larger- or medium-sized mill does not always fulfil the special requirements for instrumentation. For example, where heavy load fluctuations in the compressed air piping may occur through intermittent use of pneumatic machine tools etc., an independent compressor unit and piping system is preferable for automatic control purposes, so as to provide constant air pressure.

Basic air piping layouts

The makers of compressors and auxiliary equipment will usually advise on the choice of compressor type and how to arrange the piping system in the case of new installations, or alternatively the instrument makers will assist. For existing piping systems which are not entirely satisfactory, it may be worth-while to consider reconstruction into a looped air line. Air is passed from the compressor unit through a water-cooled after-cooler to reduce the compressed air to room temperature, and to condense moisture that can be drained off by means of an air separator and trap. Installation is best performed in the pipe after-cooler and reservoir. The ample water supply of an after-cooler must be assured, but waste of cooling water might occur with large compressor units, and thermostatic control of jacket heater and of cooling water for the after-cooler is highly advisable. A thermostatic three-way blending valve can also be used with advantage with a recirculating water system. The cooled air, at controlled temperature, goes then to an air receiver, which should be properly drained by means of a suitable air trap, if no after-cooler and air separator are used in front of it (the latter should have air traps fitted instead of drain cocks). The closed-loop piping has the decided advantage of ensuring ample supply of compressed air at the right pressure anywhere in the system at all times. Where several buildings have to be fed, more than one loop can be taken from the manifold, and each loop drained at the lowest points in the piping layout, and at points of greatest temperature drop.

A compressed air scheme for medium-sized pneumatic control system is illustrated in Fig. 1. Two compressor units are installed — one being a stand-by unit to come automatically into operation in case of failure of the running unit, or for alternative use during cleaning or servicing periods. The compressor starts under zero load in order to enable the motor to come up quickly to full revolutions. Each compressor has a small air vessel, and a larger air vessel is installed to smooth out pressure pulsations in front of the large air receiver. Air cleaning and pressure reduction are performed by an air filter and air pressure reducing valve as usual, and a safety pressure relief valve is also shown.

It should be noted that contamination of intake air to compressors due to local conditions may sometimes ac-

count for trouble, and filtering of intake air is therefore most important. Many highly-efficient air intake filters are available, providing positive protection against abrasive dust particles which score cylinder walls and wear out bearings, etc. Special silencer types ensure quiet operation as well as cleanliness. Modern filters are practically self-cleaning and can be used for long periods without much attention, although they require preventive maintenance just as any other piece of plant equipment. A useful precaution is sometimes to locate the air intake above the roof where very clean air is available, and to use flexible tubing with an intake filter fitted to its end on top of the air intake. The use of pipeline strainers using a wire mesh screen is much to be recommended for compressed air lines.

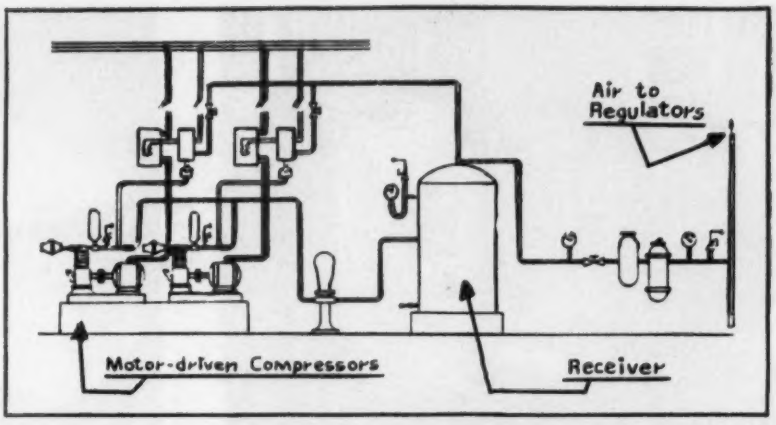


Fig. 1 — Air compressor station for air supply to larger pneumatic instrument boards.

Calculation of air supply system

Most piping systems can be calculated on about 20 psi working pressure at the compressor outlet, reduced to 15 psi at the inlet to pneumatic control instruments, i.e. with about 5 psi pressure drop. For large air supply systems, 35-45 psi at the compressor station has to be allowed for, with about 10 psi pressure drop through separator, filters and piping system for distribution. Air consumption can only be guessed, but data given by instrument makers indicate between 0.33 and 0.44 standard cu. ft. per pilot mechanism, and perhaps 0.5 cfm to be taken for piping calculations. To this, about 20 per cent should be added for leakage and blowdown, etc.

Instrument makers will usually give an estimate regarding choice of a suitable compressor type and size for reconstruction. Once the average air consumption has been established, some 10 or 20 per cent should be added for possible extensions of the air system. Sizing of pressure reducing valves can be similarly performed. Undersizing of filters must be avoided because consequent injury caused to instruments may represent a considerable loss in time and money. A filter can never be too big, and the price difference between an undersized and a correctly-sized air filter is usually comparatively small. Power cylinders must have separate air filters, and this measure is also highly recommendable for each control mechanism unit. Poor air quality should invariably prevent group filtering.

For estimates of pipe diameters, the allowable pressure drop has to be assumed as a basis for dimensions. A very useful pressure loss table for compressed air piping is shown. On the left of the table is a column indicating the equivalent volume in cu. ft. of free air per minute passing through the pipe. To the right of this are a further columns, each headed by the pipe size with its cross-sectional area. The figures in these columns are pressure drop factors, and represent the difference in the squares of the absolute pressures per 100 ft. These pressure drop factors do not include any allowance for losses through bends, tees, strainers, and filter, cock and valves, etc., and therefore a further 10 per cent at least should be added to the length to allow for this. The total length thus obtained will be referred to as the equivalent length.

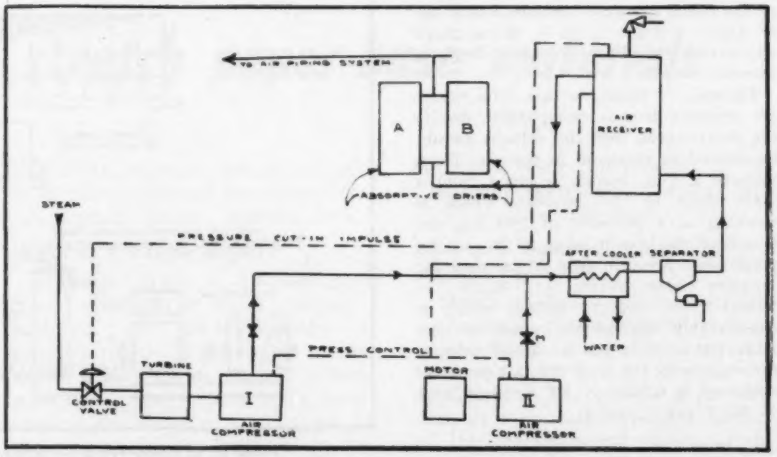
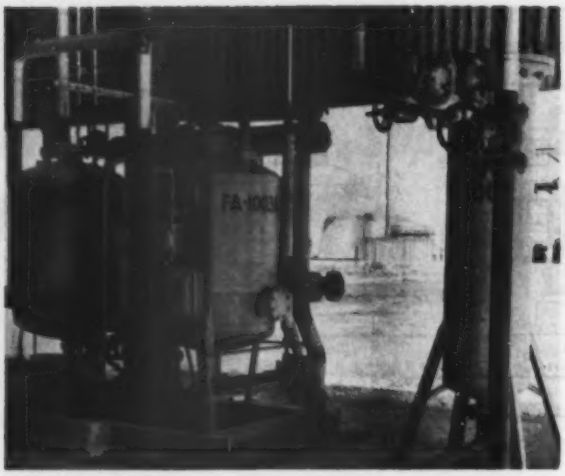


Fig. 2 — Air distribution system using compressor, after-cooler and absorptive dryers.

Example 1. Assume that it is required to deliver 1,000 cfm over a distance of 600 ft., the initial gauge pressure to be not less than 100 lb. psi. The square of the absolute pressure equal to 120 psi gauge is 18,144 and the square of the absolute pressure equal to 100 psi gauge is 13.156. The difference is therefore 4,988. The equivalent travel is 600 ft. and therefore the pressure drop factor is $4,988 \times 100/600 = 755$; therefore the actual loss as shown on the table should be somewhat below this. In the left-hand column of the table we find the figure of 1,000 cfm of air and on the right of the same line we find that a 2½-in. pipe, when passing this amount, will have a pressure drop factor of 512 and therefore this size should be suitable in the circumstances.

Example 2. Assume that a 2-in. pipe 300 ft. long has been fitted and it is required to find the pressure drop when passing 200 cfm, with an initial gauge pressure of 40 lb. psi. Then, from the table, the pressure drop factor is $62.5 \times 330/100 = 206$. This is the difference between the squares of the initial and absolute pressure. The square of the final



Absorptive air dryers for instrument air (Minneapolis Honeywell).

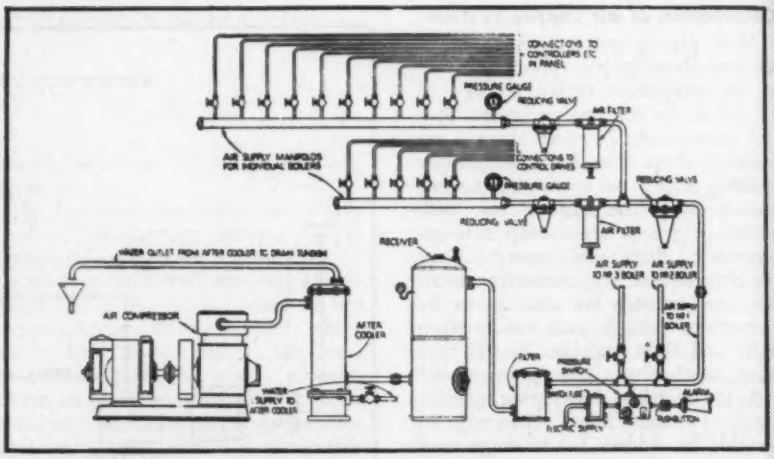
Chemical moisture removal

Moisture removal prevents rust and corrosion of air piping. Accumulation of water may cause "water hammer" by collecting in low spots, and also reduces the capacity of pipes by partially filling them with water. The latter condition can cause stoppage of air flow and possible bursting of pipes during freezing temperatures. Moisture may also carry dirt or sediment which may plug the fine tubing and choke fine restrictions in the instrument mechanism. Mechanical moisture removal by means of air separators, etc., is well-known, but in this article the use of chemical drying

(Continued on page 742)

absolute pressure is therefore the square of the initial absolute pressure minus 206 = 2,992 − 206 = 2,786 = 38 psi gauge approximately. The pressure drop is therefore 2 psi.

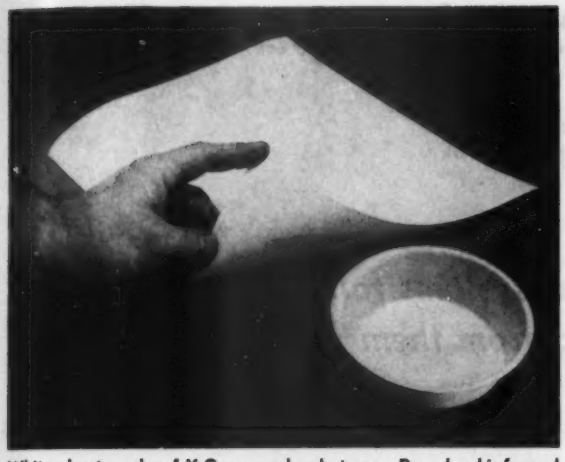
Example 3. Should a case arise where the pressure drop is unimportant, due to the short travel, then the velocity should be limited to about 50 ft. per sec. Thus, suppose a 1-in. branch is taken from a main close to the receiver, which is working at a pressure of 250 psi, the length of the branch being 25 ft. and the permissible pressure drop 20 psi then the pressure drop factor = 70,055 − 59,860/25 × 100 = 40,780, which is considerably beyond the range of the table; but at 50 ft. per sec. actual velocity the volume in cu. ft. of free air per min. delivered is 0.7854 × 50 × 60 × 14.7 × 264.7/144 = 294.2.



Hook-up of compressed air supply to instrumentation (Bailey Meter).

LOSS OF PRESSURE CAUSED BY FRICTION OF COMPRESSED AIR FLOWING IN PIPES

Equivalent volume in cu. ft. of free air per minute passing through pipe.	1 in. .7854 sq. in.	1¼ in. 1.227 sq. in.	1½ in. 1.767 sq. in.	2 in. 3.142 sq. in.	2½ in. 4.908 sq. in.	3 in. 7.068 sq. in.	3½ in. 9.621 sq. in.	4 in. 12.56 sq. in.	5 in. 19.63 sq. in.	6 in. 28.27 sq. in.
	Difference of squares of initial and final absolute pressures per 100 ft. travel.									
50	125.0	40.9	16.5	3.9						
75	218.2	92.2	37.0	8.8						
100	500	164.0	65.8	15.6	5.1					
150	1125	368.6	148.1	35.2	11.5	4.6				
200	2000	655.4	263.4	62.5	20.5	8.2	3.8	1.9		
250	3125	1024	411.5	97.7	32.0	12.9	5.9	3.1		
300	4500	1475	592.6	140.5	35.1	18.5	8.6	4.4		
400	8000	2621	1053	250.0	81.9	32.9	15.2	7.8	2.6	
500	12500	4096	1646	390.6	128.0	51.4	23.8	12.2	4.0	
600	18000	5898	2370	562.5	1884.7	74.1	34.3	17.6	5.8	2.3
800		10486	4214	1000	327.7	131.7	60.9	31.3	10.2	4.1
1000		16380	6584	1562	512	205.8	95.2	48.8	16	6.4
1500		36960	14814	3516	1522	463	214.2	109.9	36	14.5
2000			26339	6250	2048	823	380.8	195.3	64	25.7
3000			59260	14050	4608	1852	856.8	439.5	144	57.9
4000				25000	8192	3292	1523	781.2	256	102.9
5000				39060	12800	5144	2380	1221	400	160.7
6000				56250	18470	7407	3427	1758	576	231.6
8000					32770	13170	6093	3125	1024	411.5
10000					51200	20580	9260	4883	1600	640.0
15000						46300	21420	10990	3600	1447
20000						82300	38080	19530	6400	2572
25000							59500	30520	10000	4019
30000								43950	14000	5987
35000								59810	19600	1877
40000								78120	25600	10288
50000									40000	16070
60000									57600	23150
80000									102400	41150
100000									160000	64000



White sheet made of X-Crepe and polystyrene. Deep bowl is formed from the same product under heat and pressure.

V. E. Calvin (left), vice president (sales) and Ford Larrabee, president, examining molded products as they come from the press.

All-directional stretch paper-base materials

CINCINNATI INDUSTRIES INC., has developed a new line of paper base materials, utilizing X-Crepe in various thermoplastics combinations. The materials lend themselves to the production of an array of three-dimensional products which promise an equally imposing number of diversified applications. It is believed that the development will open an entirely new concept of industrial production of paper products.

The unique property of the new paper is its balanced, all-directional stretch during the forming process. The stretch may amount to as much as 60 per cent in any direction of the thermoplastic-paper combinations.

What is X-Crepe paper?

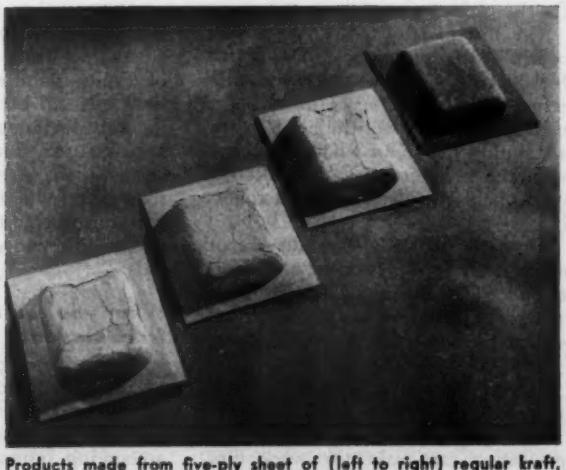
X-Crepe paper is manufactured from ordinary kraft paper—bleached or unbleached—by a simple process of creping it successively at 45° angles on two drums, with the second creping knife cross-creping the sheet at a 90° angle to the creping pattern imparted by the first knife. The result is a versatile, low-cost, all-directional stretch paper that can be impregnated with wax, resin, rubber, or asphalt or laminated with other layers of X-Crepe and thermoplastic sheets into multi-ply base materials.

How are three-dimensional objects formed?

Sheets of X-Crepe are alternated with sheets of thermoplastics (e.g. polystyrene) until the required thickness is reached for any desired application. The plastic sheet may provide the inside or outside surface of the manufactured object, if desired, thereby insuring an extremely smooth and attractive effect on the molded article.

(Continued on page 740)

Kraft paper being creped at 45° angle on the first drum followed by cross-creping on the second drum.



Products made from five-ply sheet of (left to right) regular kraft, machine-creped kraft, extensible kraft and X-Crepe.

Standard cost accounting for paper mills

EDWARD W. RODGERS, Partner
Cassel, Gronewog, Rohlfing & Clark

Part III — Why standard cost systems fail and what may be expected from them

DESPITE the impressive virtues of standard cost methods, there are many standard cost systems that have been disappointments and have failed to justify the cost of the installation and operation of the system. These failures do not reflect faults of the standard cost principle, but result from misunderstandings, faulty procedures, faulty organization and human failures. The most common reasons for failure of standard cost systems are:

Inertia and conservatism:
Too often managers or accountants will refuse to accept new procedures or new methods simply because they change existing habits and practices. By actively opposing the necessary changes, or by passively failing to make an effort to use the new methods, a manager or accountant can cause the failure of any system.

Misunderstandings:
On the part of managers who fail to understand the purposes of the system, or who fail to make the effort to study and understand the reasons for the various procedures;

On the part of accountants who overload the procedures in a search for precision and accuracy, or who refuse to give the needs of management precedence over the needs of an accounting system, or who fail to cope with the voluminous figurework that is inevitably involved in cost accounting;

On the part of sales managers or others who refuse to make the effort to understand the use of standard costs as a basis, or starting point, for factual determination of past and future costs.

Poor planning and organization of procedures:
In any work to be done good organization can make the work flow steadily and smoothly, while bad organization fails to cope with bottlenecks, complications or setbacks; the design and formulation of the cost accounting procedures requires much knowledge and many skills, and the responsible accountant or engineer may fail to design and assemble a workable set of procedures.

Poor basic information, such as production reports, scrap reports, material usage reports, etc.:
The standard cost methods provide for translating quantities of labor, material and expense (which may be expressed in hours or pounds or number of pieces, or in some other unit) into dollars of cost; obviously, any error in stating the quantities will result in an error in stating the costs. In many cases efforts toward comprehensive standard cost methods have been temporarily abandoned while procedures were developed to obtain accurate and reliable production figures.

Faults in standards used in the system:
Contrary to the beliefs of many accountants and managers, a well-organized and well-designed standard cost accounting system will not fail because of faulty standards, although faulty standards can be temporarily misleading and discouraging. If faulty standards are used, careful analyses of variances will soon reveal the faults in the standards, and those same analyses will furnish most of the information needed to revise and correct the standards.

What you can expect from standard costs

If a management decision is made to adopt standard cost methods, here is what needs to be done:

1. A careful survey of the present accounting system, of the production records that are available in any form, of the flow of products through the various operations, and of the reports and other control information that is furnished to management.

2. A study of the attitudes of management and accountants toward changes in cost accounting and toward accounting controls in general, and an evaluation of the amount of knowledge that managers and accountants have concerning standard cost methods and other modern managerial techniques.

3. Assignment of an experienced accountant, or engineer (from within the company if possible), to design the cost accounting and reporting procedures, and to direct the executives, engineers and supervisors in compiling the data needed for establishing the standard cost system.

If these things are carefully and intelligently done, management can look forward to:

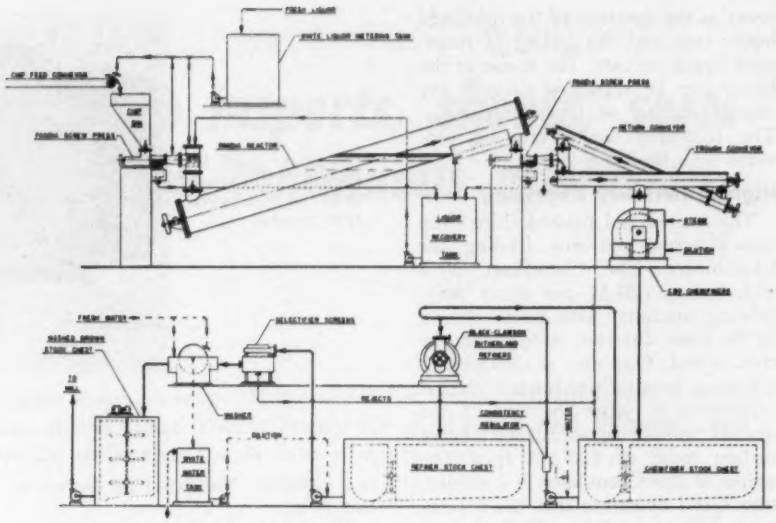
1. A considerable period of disorganization and turmoil while the standards are being developed and while the new procedures are being installed, and during the shake-down period of experimentation, revisions and modifications.

2. A growing awareness, on the part of all levels of management, of the factors that cause cost fluctuations and that result in variances, along with a greatly improved understanding of what can be done to eliminate or reduce these variances.

3. An improved understanding on the part of sales executives and other management personnel of the costs of various products, and of the impact on those costs of alternative materials or production methods.

4. A confident feeling that the managers can now understand what is happening in the business, where operations are improving, where they are worsening and what needs to be done to get continued improvement.

New continuous cold soda pulping system



Flow sheet for new cold soda pulping system.

Unique system features low horsepower requirements and complete fiberizing effect; chips are impregnated with white liquor in the screw presses and fiberized at high consistency in Chemifiners.

SUCCESSFUL TEST RUNS have been completed on the new Black-Clawson continuous cold soda pulping system, developed by the Pandia Div. of Black-Clawson Co. Utilizing the Pandia screw press and reactor, the newly-developed Black-Clawson Chemifiner and the Sutherland disc refiner, as well as Selectifier screens and valveless filter washers, the system will produce exceptionally high quality pulps from hardwood chips in a wide range of freenesses and with surprisingly low horsepower consumption. No steam or hydraulic pressure is required in converting the chips to pulp.

Development and testing of the new Cold Soda System* was carried out at Black-Clawson's commercial-scale Pandia pilot pulp mill in Berlin, N. H. Northeastern hardwood species provided the first test wood, and hardwoods from other regions have also been pulped successfully. Tests of the pulp made at the Berlin plant and also by several leading research and paper mill laboratories indicated the following characteristics:

1. Extremely well-fiberized pulp.
2. Strengths ranging from those shown by softwood groundwoods to those of hardwood sulfite pulps and better.

*Patent applied for

How impregnation is achieved

In the new continuous pulping system, hardwood chips are first conveyed to a hopper where they are sprayed with white liquor. The spray operates only when the chips are being furnished, since the liquor supply is controlled by a solenoid-operated valve actuated from the conveyor drive motor. The amount of chemical added depends on the species of wood and the grade of pulp desired.

From the hopper, the chips pass into the first Pandia screw press where they are compressed and relieved of air and excess moisture by the action of the screw press. Preliminary impregnation of the chips takes place here. The liquor removed from the chips is collected and flows to the recovered liquor tank.

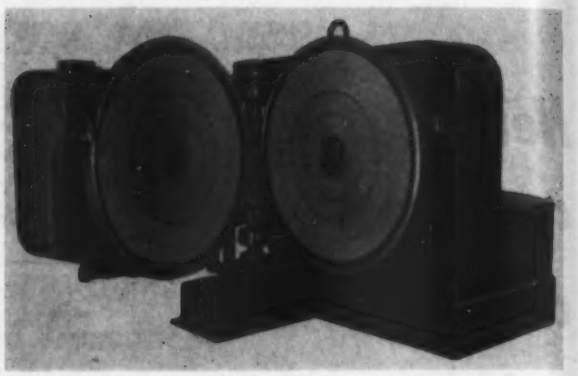
The compressed chips are released at the outlet of the screw press while submerged in white liquor. As the chip mass expands, it rapidly absorbs this liquor and the chips become impregnated. The impregnated chips are continuously introduced into the base of the Pandia reactor into which white liquor is introduced from the white liquor metering tank through a control valve. Recovered liquor is also introduced into the recator from the recovered liquor tank. The flows of the two liquors are coordinated to maintain the required level in the reactor.

The chips pass upwards through the inclined Pandia reactor while immersed in liquor in which the ratio of liquor to solids is approximately 6-1. A retention time of up to 20 min. is provided. This retention time can be varied, inasmuch as a shorter time may be desirable for some pulps. The chips emerge from the liquor after covering about two-thirds of the traveling distance through the reactor and pass over a drainage section. Provision can be made to spray the chips additionally as required for certain operating results. This spray liquor is supplied from the recovered liquor tank, its amount being set by hand valves and maintained at this setting for any given condition.

The drained, treated chips drop into the second Pandia screw press, where excess liquor is extracted to bring the treated chips to a dryness of approximately 50 per cent. The uniformly-penetrated chips, which are greatly softened by the swelling and chemical action of the liquor, undergo a coarse defibering action in the second screw press which puts them in excellent condition for the primary defibering operation.

The liquor removed from the treated chips is collected and flows in part to the recovered liquor tank to join the liquor drained from the chips in the reactor as already described. A part of the liquor from the second screw press is allowed to go to the

sewer as the demands of the recovered liquor tank and the cycling of recovered liquor indicate. The re-use of the liquor can be regulated to give any desired number of liquor turn-overs. The recovered liquor tank is provided with level controls.



Chemifiner used in fiberizing treated chips in the cold soda process.

High consistency fiberizing

The treated and pressed chips drop into a screw conveyor feeding the Chemifiners. The Chemifiner is a high-density (20-35 per cent) pulp-treating machine, with discs rotating in the same direction at relatively the same speed. One disc is mounted in a floating housing which has a vertical adjustment to offset the axis of the disc to produce an adjustable relative surface speed of 100-250 fpm. The action of the Chemifiner is a unique, slow-speed operation that has a powerful defibering effect without loss in freeness or fiber length.

The Chemifiners have a self-contained screw feed which ensures positive feed of the impregnated chips to the defibering surfaces. The entering material is diluted to a consistency of 25-30 per cent before entering the defibering zone. The temperature may be increased to approximately 165° F. at this point by the addition of steam. The completely-penetrated chips after the second screw press are processed in the Chemifiner for primary fiberizing at exceptionally low horsepower per daily ton. It is estimated that the power consumption for this defibering stage will be about 4 hp-days per ton, with a freeness of approximately 650 cc (Canadian Standard) or higher at this point.

The defibered pulp from the Chemifiners is diluted as it drops into a chest maintained at about five per cent consistency. The defibered pulp is pumped through a consistency regulator directly to the Sutherland refiners for secondary refining, freeness reduction and strength development. These refiners are single-disc units operating under pressure. Pumping of the stock to the refiners is controlled by recirculation of a small portion to the Chemifiner stock chest.

The defibered stock is refined to any desired freeness. It is estimated that the power consumption for the second stage will be about 6-11 hp-days per ton, depending on the freeness.

Screening and washing

Pressure screening is provided in Selectifiers followed by washing in valveless filter washers. The finished pulp is then ready for bleaching or direct use in paper manufacture.

Pulp properties

When a low chemical concentration is used, the new Cold Soda System produces a groundwood type pulp which has a high opacity for this grade. With higher chemical concentrations, stronger pulps are made. The variety of sold soda pulps that can be produced by simple chemical changes, establishes the system as highly flexible. Completely defibered pulps, well suited for bleaching, have been made with only 10 hp-days per ton.

Adhesives

(Continued from page 732)

is laid down, the pores are closed to prevent the feathering of liquid writing inks, surface strength is increased, resistance to picking is provided, and bursting, folding and tearing strengths are increased.

The use of adhesives in paper coating is described in Technology of Paper Coating* and Tappi Monograph No. 9**.

They function here either as primary or auxiliary adhesives. As primary adhesives, their function is to bond the pigment to the base paper stock. As auxiliary adhesives, animal glues are compatible and stable in clay-based coating mixtures with other adhesives, such as starches, casein, soya protein and latex emulsions. As auxiliary adhesives, they also exert a unique property of improving the fluidity of clay coatings modified with other pigments, especially when prepared at high solids content.

Among the properties that make the use of animal glues in coating mixtures desirable are: high adhesive strength and pigment-suspending power at low ratio to pigment; non-crocking and smooth film-forming properties; compatibility with pigments, dyes, and base stocks in acid, slightly alkaline, or neutral systems; moisture resistance on hardening; and freedom from objectionable odors.

In view of their great resistance to oils, greases and organic solvents, animal glues are used as a laminating adhesive and saturant (after plasticizing with glycerol) for paper earmarked for conversion into gaskets for internal combustion engines, oil filters, etc.

*Whitcoff & A. W. J. Dyck, Fritz Publications, Inc., 1957

**Protein and Synthetic Adhesives for Paper Coating, 1952

All-directional stretch

(Continued from page 737)

The layers of X-Crepe and thermoplastic sheets are then preheated in a press to approximately 300° F and immediately blown into molds by air pressures of about 300 psi. The molds can be machined steel or epoxy cast. The method features maximum flexibility and versatility, permitting the use with equal facility of single- as well as multiple-cavity molds.

What are some of the applications?

As demonstrated by Cincinnati Industries, the new paper base materials lend themselves to the pro-

(Continued on page 744)

New finishing machine inspects, sheets, sorts and piles paper in one continuous operation

New machine inspects the sheet for lumps and voids, sheets it to size, stacks good sheets ready for packaging and shipping, and directs defective sheets into a reject pile.

THE DEXTER COMPANY, Div. of Miehle-Goss-Dexter Inc., in co-operation with the S. D. Warren Co. and the Champion International Paper Co., has developed a new paper finishing machine which in one continuous operation inspects the web for lumps or voids, sheets it to size, stacks good sheets smoothly and evenly ready for packaging and shipping, and directs defective sheets into a reject pile.

The machine, the first of its kind, has been under development for some four years and is currently being evaluated in daily operation at the S. D. Warren Co. It includes an unwind stand with automatic tension control rolls, inspection station, reel-type cutter and layboys for first quality paper and rejects. Roll sizes may range from 32-82 in. in width and to 42 in. in diameter. The paper web may be sheeted in lengths ranging from 36-80 in.

Inspection stand

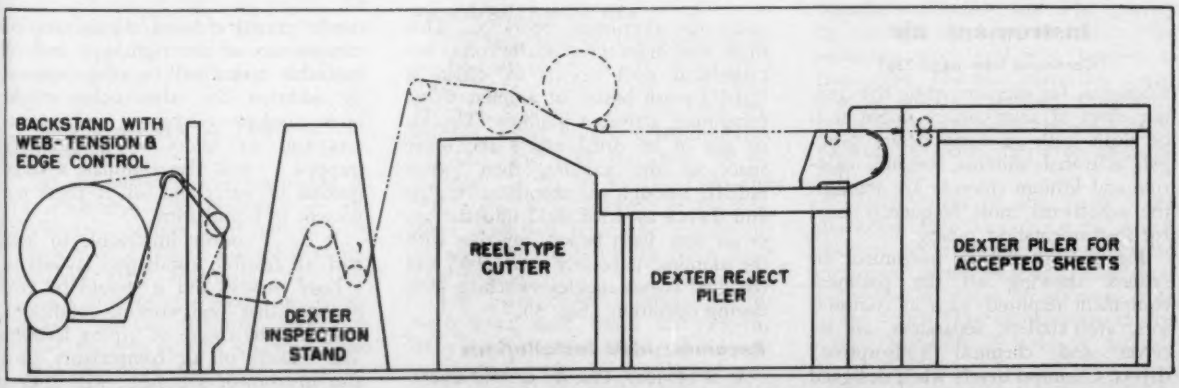
The unwind stand is a shaftless type and the web unwinds from it through tension control rolls to the inspection stand. This stand has two inspection stations, one which inspects for lumps, wrinkles, welts, etc, and the other which inspects for holes, tear-outs and other voids. The inspection devices sense flaws by contacting and "feeling" the surface of the moving web.

Should a defect be encountered, a memory device is signalled and when the imperfect sheet reaches a certain point on the tape bed, guide fingers rise from between the tapes and deflect the sheet to the reject pile. The machine can also be fitted with web markers to provide a visual indication of the location of the defects in the rejected sheets. The memory device is a magnetic tape type, engineered especially for the purpose by de Florez Co., a design affiliate of the Dexter Co.

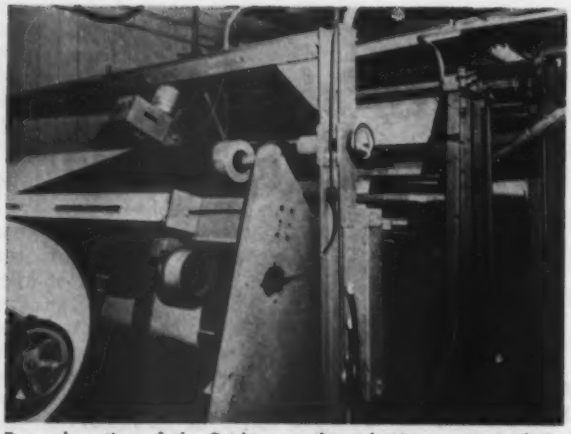
Cutter and sheet pilers

After leaving the inspection stand, the web travels to the cutter which sheets it to size and discharges the sheets onto tapes for delivery to a layboy. The good sheet piler is located at the end of the tapes and the reject piler is under them. A counter indicates the number of good sheets as they are piled and marker tapes are automatically inserted every 25, 50, 100, 250, or 500 sheets, depending upon customer preference.

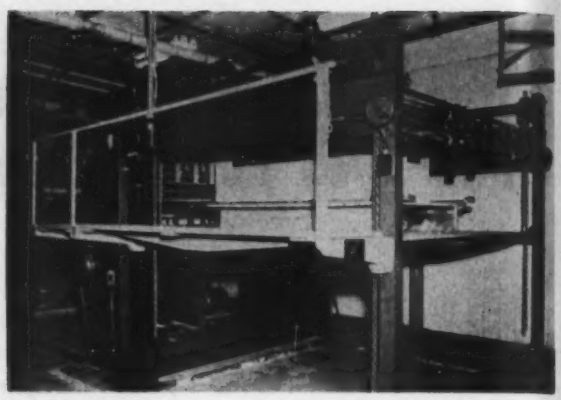
Sheets are cut within 1/64 of an inch of nominal size—due principally to constant web-tension con-



Line drawing illustrating the various elements of the new paper finishing machine developed by The Dexter Co., Div. of MiehleGoss-Dexter, in co-operation with the S.D. Warren Co., and the Champion International Paper Co.



Forward section of the finishing machine showing portions of the unwind stand, inspection stand and cutter. Shown above one of the unwind rolls is the electronic device which controls edge register.



View from the rear of the finishing machine showing the Dexter piler which stacks good paper ready for shipping. Unique piler platform is less than 2 in. thick yet carries loads weighing up to 8000 lbs.

trol at the unwind stand. An electronic side guide is used to keep the web traveling true and the machine is also equipped to trim web edges when this is desired. Trim is pneumatically conveyed to a waste cart.

Several steps have been taken to maintain sheets in perfect condition and to stack good sheets in such a manner that the completed pile is ready for shipping. Sheets travel 15-20 in. apart (are not overlapped) to permit one sheet partially to settle on the pile and be jogged before the next sheet arrives. Forwarding wheels which advance the sheet from tapes to pile automatically slow down as the last few inches of the sheet passes between them, thus retarding sheet speed (in excess of 400 ft/min) to prevent damage to the front edge upon hitting the piler stops. Timed air is blown onto the top of the sheet as it reaches the pile to hasten settling. Side joggers are drilled with holes counter-sunk on the pile side so that sharp oscillation of the joggers from the pile creates a fanning effect and quickens the exit of air from beneath the settling sheet. Since there is less concern for the appearance of the reject pile, the reject piler has simpler slow down and jogging devices.

Two-roll operation provided

At present, the finishing machine is operated with a single roll. However, two-roll operation can be provided. Two-roll operation will involve two unwind stands and two inspection stations but will employ the present cutter and layboys. This will more than double the capacity of the more expensive portions of the equipment and is well justified economically despite the fact that for each defective sheet, one good sheet will be rejected. The small amount of wasted good paper can well be afforded for the additional production achieved, or alternately the rejects can be resorted to reclaim the good paper.

The general goal in inspecting paper is to furnish the printer with stock that will not contain lumps or foreign matter that might cause type smash-ups, will not contain holes through which ink could pass and require downtime for press wash-up, and will not have turned corners or short sheets which would cause press trips. The finishing machine sensitivity setting in any given case will depend upon the standards for the particular grade of paper and upon mill requirements. More than sufficient sensitivity is provided in the instruments to permit detection of defects smaller than those normally requiring removal.

Instrument air

(Continued from page 736)

substances for supplementing the cooling effect of after-coolers might well be dealt with in some detail. Silica gel, activated alumina, calcium chloride and lithium chloride are amongst the adsorbents most frequently used for instrumentation piping.

Fig. 2 illustrates an instrument air system, showing all the pertinent equipment required, such as compressors, after-coolers, separators, air receiver and chemical (adsorptive) dryers. Chemical dryers when designed for summer conditions will be adequate for winter use. Two absorbing vessels are used with change-over cocks for alternative operation. This filter- and dryer-type usually comprises cylindrical steel vessels in which is fitted a mesh basket of annular shape containing activated alumina. The air or gas to be dried enters the inner space of the annules, then passes radially through the absorbent reagent and thence as dried fluid into the gas or air line. Each basket, together with the alumina, is readily removable, and the dual layout enables switching over during operation (Fig. 3).

Recommended installations

It is obvious, that by careful operation of the compressor, and by choosing the right lubricating oil, the incidence of oil within the piping system can be greatly reduced. Application of compressors of the right-type and of reputable makes will be advantageous. In addition the after-cooler might often condense oil vapors, and separators and air filters — if correctly trapped — will also eliminate a large portion of water and oil, if these are present in liquid form.

It is, of course, impossible to deal with all feasible installation layouts in a brief survey, and it should be emphasized that local working conditions influence the choice of piping layouts. The makers of air compressors, and also instrument suppliers, will always advise the user of pneumatic control instruments as to the best methods of

(Continued on page 744)

45th annual meeting of the technical section of the Canadian Pulp and Paper Association

▶ **Fourdrinier wire life discussed during an all-day session; J. McK. Limerick elected 1959 chairman of the Technical Section.**

FOURDRINIER wire life was one of the main topics discussed at the 45th Annual Meeting of the Technical Section of the Canadian Pulp and Paper Association held at the Queen Elizabeth Hotel, Montreal, on January 28-30, 1959.

The all-day session discussing the factors affecting fourdrinier wire life was under the chairmanship of A. D. Hamilton, Quebec North Shore Paper Co. The topic is an extremely timely one, and of considerable concern to the pulp and paper industry, in view of the alarming rate of decrease of fourdrinier wire life with the rapid increase of machine speed. On a modern high speed paper machine, wires rarely last longer than six days, entailing a replacement cost of about $3000 per individual wire change.

Other topics discussed at the annual meeting included: chemical pulping problems; fine paper manufacture; paper board production; inter-relation of ink and paper; material handling in pulp and paper mills; stock proportioning systems; paper drying problems; and bark burning.

J. McK. Limerick — 1959 chairman

At the Business Luncheon, Dr. R. D. Duncan, 1958 chairman of the Technical Section, announced the election of J. McK. Limerick as the Section's 1959 chairman. Mr. Limerick is director of research and development of the Bathurst Power & Paper Co. He is well known in the U.S.A. through his extensive activities in TAPPI where he currently is chairman of the Alkaline Pulping Committee.

Awards presented during the Business Luncheon were as follows:

The Weldon Medal was awarded to Dr. W. H. Gauvin and George Lee of the Pulp and Paper Research Institute of Canada for their work on the development of a new waste-disposal technique.

The Howard Smith Medal was won by B. I. Howe, R. G. Lepine and I. R. A. Gregory of Anglo Paper Products.

The F. G. Robinson Technical Section Award went to Dr. A. H. Vroom, Consolidated Paper Corp., for outstanding leadership given to the Section's Fundamental Research Committee.

Winners in the Gadget Competition were Gaston Brosseau, Anglo-Canadian Pulp & Paper Mills, for a special design of pipe line elbows that resist erosion, and M. J. Hudec, St. Anne Paper Co., for an automatic chip-sampling device.

Fourdrinier wire life

The results of an investigation into fourdrinier wire life made by a Task Force consisting of C. E. MacDonald, Canadian International Paper Co., R. M. Stuart, St. Anne Paper Co. Ltd., and J. G. Buchanan, B. W. Burgess and K. E. Vroom, Pulp and Paper Research Institute of Canada, were discussed from the standpoint of wire failure resulting from wear and damage.

The main factors responsible for wire wear were listed as: (1) the drag load exerted by the flat boxes on the wire; (2) the wire speed; (3) the quantity of grit in the headbox stock.

Factors which played an important role in wire damage are: (1) mesh of the wire — a finer mesh wire appears to be more susceptible to wire damage; (2) incidence of stock jams which are affected by shower cleaning of the wire, the angle of wrap of the wire around the wash roll, the radius of the wash roll, and wire tension; (3) length of the wire.

To lessen wire wear it is recommended that flat box drag be reduced. This can be done in some cases by reducing the amount of water removed at the boxes and increasing the water removal by the table rolls and couch. Wire wear due to grit is an important factor and hence the need for adequate cleaning equipment. However the main emphasis should be directed to the development of flat box materials and a flat box design that would minimize the influence of grit on wire wear.

The most serious damage to the wire is due to stock jams at the first outside wire return roll. The severity of damage here can be reduced by reducing wrap and wire tension at this point. The best corrective measure is suitably located showering equipment to prevent the sheet from passing between the wire and the roll.

The findings of the Task Force disclosed that machines which showed no evidence of jams were equipped with pick-ups and dual high-pressure knock-off showers close to the couch. The showers are turned on automatically by a break detector on the first press.

The wire mesh should be as coarse as possible. Where a coarse mesh is objectionable on grounds of wire

mark, the problem can be corrected by the use of grooved table rolls.

Stock proportioning

The installation and satisfactory operation of magnetic flow stock proportioners to replace a gate-type stock proportioner at Price Bros'. Riverbend mill was described by W. E. Hawkings. Each installed proportioner includes: a liquid level controller; a six-inch magnetic flow transmitter for sulfite; an eight-inch magnetic flow transmitter for groundwood; two Dynalog flow recorders equipped with integrator, pneumatic transmitter and valve position recording pen; one ratio controller; one six-inch and one eight-inch Ratogate stock valve; a Pulsafeeder color pump; and a liquid level transmitter. An interesting feature of this installation is the complete omission of bypass circuits around the flowmeters and control valves.

B. Rosenbaum, Crown Zellerbach, described the automatic continuous proportioning system installed at the mill following the conversion of No. 2 machine to the production of rotoprint. The system meters continuously, through concentric orifice plates, a 3 per cent consistency groundwood stock and a 2 per cent consistency sulfite stock, with flows being controlled through flex valves.

The initial problem of excessive vibration of the flex valves was overcome by installing a gate valve in the down-stream section of the mixed stock line to relieve the excessive pressure drop across the valves. Even so, it was necessary to install additional bracing on the pipes to eliminate the possibility of pipe damage.

A comparison of magnetic and area flow meters by M. Krayewski and G. L. Cooper led to the conclusion that the magnetic flow meter has several important advantages: (1) it has twice the accurate metering range; (2) with no obstruction (i.e. float) there is practically no pressure loss across the instrument; (3) instrument plugging with foreign matter is practically eliminated; and (4) simplicity of installation.

Infra-red radiation in paper drying

K. M. Eisele of the National Research Council reported results on the drying of different kinds of paper with infra-red radiation and achieving successful profile moisture control. The efficiencies ranged from 14 per cent at low moisture levels to 37 per cent at higher moistures.

No surface damage of the paper could be observed when exposed to radiation densities of 2 watts per square cm. Surface temperatures up to 80°C. were recorded.

Bark burning installation

A $300,000 bark burning installation (exclusive of the boiler) was described by P. V. Palmer and T. W. Houghton, Canada Paper Co. The effluents from the barking drums are collected and strained in a trough equipped with perforated stainless steel bottom plates and a flight conveyor with scrapers that ride on the plate to collect the bark and keep the drain holes clean.

The flight conveyor carries the bark to a hopper located above the bark press. The hopper is equipped with a damper (which permits bypassing the press if necessary) and a device to spread the bark over the entire width of the 55-in. dia. rotating drum of the barkpress.

The press made by Horton Steelworks to a patented design by Fibre Making Processes is the first of its kind used in Eastern Canada.

Progress in forest genetics

(Continued from page 733)

Carolina or Texas—a tree whose wood is best for kraft or for newsprint. But no one tree can be best for all purposes or situations. The forest geneticist is fully aware of this lack of universal suitability of any single strain; he therefore, is trying to tailor-make a tree most suitable to grow in one area, on one site, with wood best for one product. Another tree must be developed for another place or a different set of conditions.

One major shortcoming so far with the forest genetic studies in the South has been the emphasis on pine to the almost complete neglect of hardwoods. Since pine is generally considered the more valuable tree with the greatest immediate potential, almost all industrial emphasis has been on them. But it would be short-sighted, indeed, if we failed to start studies on hardwoods, and start now! It is axiomatic that basic information must be built up in advance of application if the latter are to be efficient and sound. Surely we should learn something from mistakes in pine improvement where we are now faced with pressures for application which are far outstripping the supporting basic information.

Instrument air

(Continued from page 742)

installing new compressed air instrument lines, or how to improve existing but inadequate air pipelines. A good opportunity for improving compressed air instrument systems will usually occur when additional pneumatic control instruments have been installed. This is also the appropriate time to consider the addition of adsorbent humidity dryers, incorporation of correctly-installed air traps, and sometimes redesigning of the whole piping layout following modern principles, as set out above.

In an economical and practical installation, the main elements include an after-cooler, an air separator with air trap and an air filter inserted in the pipeline. Additional equipment includes a pressure-reducing valve that is usually set to provide between 20 — 30 psi air pressure, depending on the requirements of the instrument makers, and the necessary gauges, valves and fittings. It is most important to note that a separate air pressure regulator should be provided for larger layouts at each instrument further to reduce the pressure to the 17 psi required by the instruments.

A diagram of a typical arrangement of a compressed air supply system for control panels using pneumatic instruments is illustrated in Fig. 4. It consists of an air compressor, after-cooler, air receiver, air filter, pressure alarm switch and main pressure reducing valve. The pipe then branches off to two manifolds, in front of each of which is located an air filter, reducing valve and pressure gauge. Each pipe can be shut off by means of an aircock located near the manifold, and labels on the latter clearly indicate each panel instrument served.

All-directional stretch

(Continued from page 740)

duction of complete toys, decorative trays and boxes, and many types of rigid packaging.

Among the envisaged applications are their use in the manufacture of interior building walls, automobile body tops, automobile instrument and door panels, the latter equipped with arm rest, etc. All these objects could conceivably be molded in one piece with these new materials—the only limiting factor being the size of the molds.

From all indications, an extremely bright future seems to be in store for these materials.

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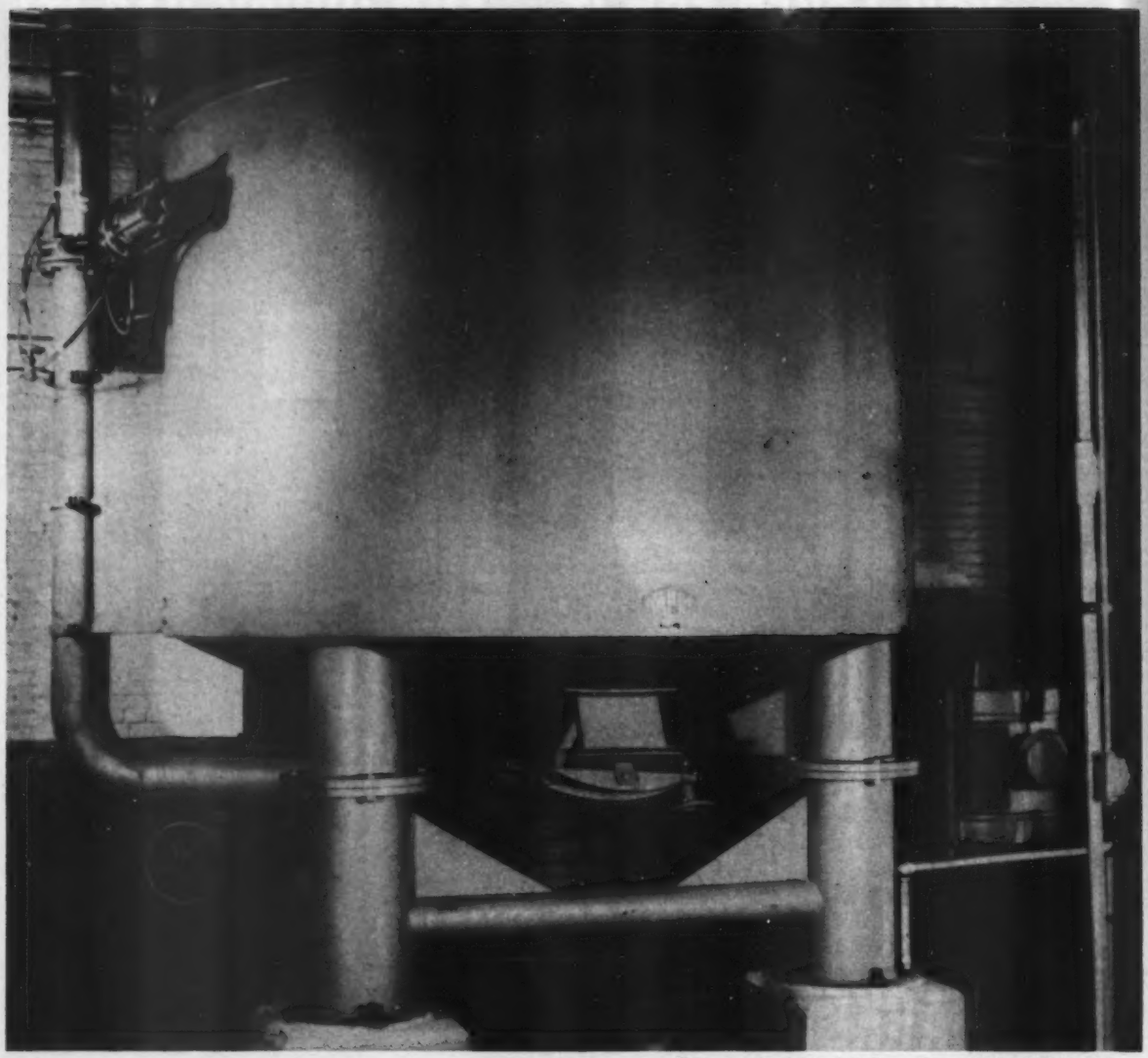

Photo courtesy Waterfalls Tissue Corp., Mechanic Falls, Maine

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AT WATERFALLS TISSUE CORPORATION
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TIME — FIFTEEN MINUTES

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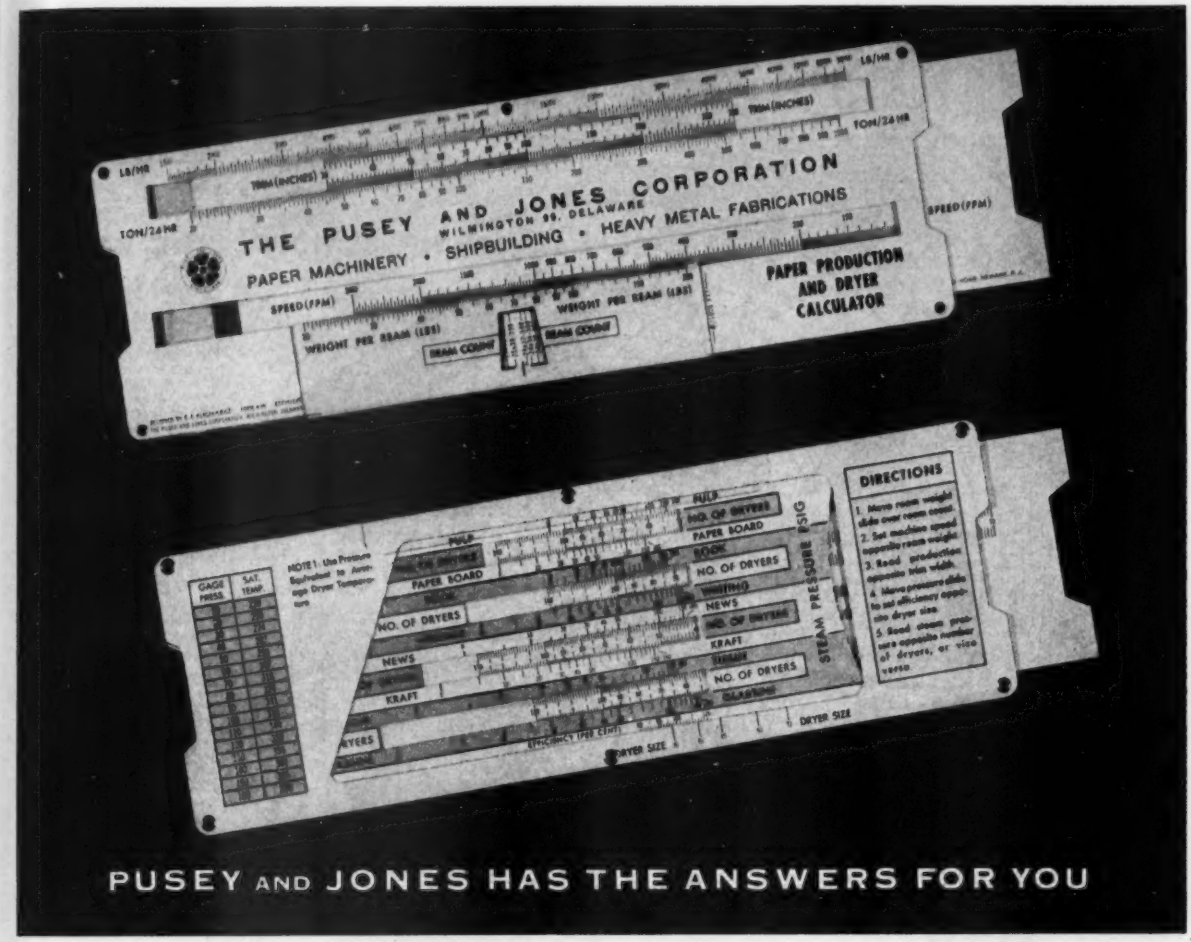
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DIRECTIONS
PUSEY AND JONES HAS THE ANSWERS FOR YOU

With Pusey and Jones' new free Calculator you can do a fast, accurate job of figuring ream counts, dryer size, type of paper and other mill data.

Just fill out the coupon—it will bring you Pusey and Jones' new Paper Production and Dryer Calculator—a new kind of slide rule that will save you many hours in your day-by-day mill operations.

It's easy to use, sturdily constructed and convenient—measures only 9½ inches by 3⅛! Not for sale anywhere, it's available *only* from the first company in the United States to specialize in the design and manufacture of paper-making machines. See a Pusey and Jones representative or write direct.

What you can do* with PUSEY AND JONES'
NEW PAPER PRODUCTION AND DRYER CALCULATOR:

Figure This:	When You Know:
Daily and hourly production	Ream weight and count, speed and trim
Equivalent ream weight	Both ream counts
Speed	Desired production, any ream weight-count combination and trim
Number of dryers needed in a new machine	Weight, ream count, speed, type of paper and steam pressure
Dryer efficiency in your present machine	
Extra dryers or increased steam pressure required in rebuilding for greater production, change of speed, different weight or conversion to another type of paper	

**At least 8 different calculations can be made quickly and easily. Above calculations may be reversed or altered depending on knowns and unknowns.*

Please send one of your new Paper Production and Dryer Calculators.

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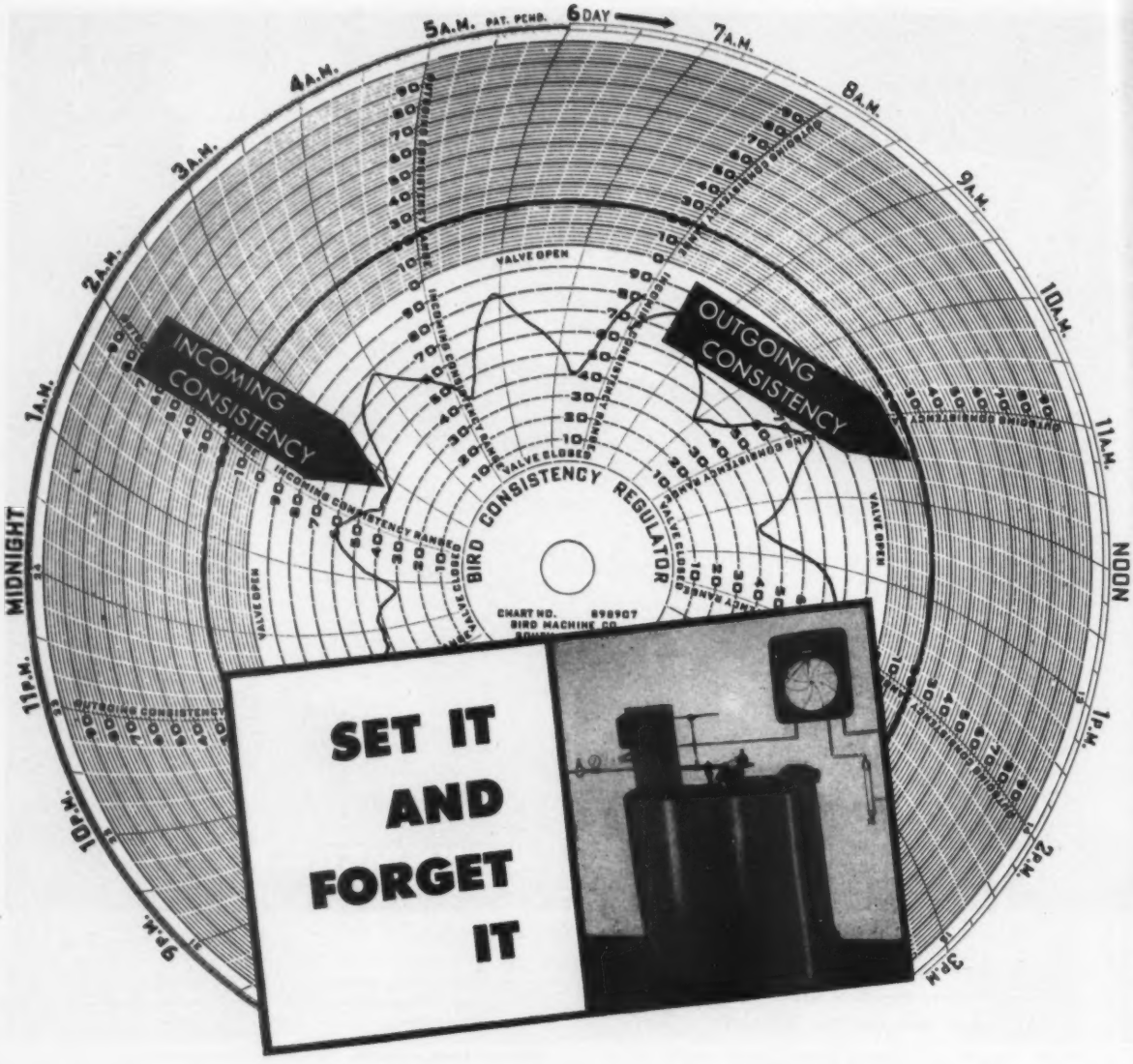

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CURRENT COMMENTS

Uncle Sam spends more . . . world's record set by Bowaters . . . research to be discussed

By WARREN B. BULLOCK

The manner in which the United States government has tried to apply its anti-trust laws to Canadian subsidiaries of American corporations, particularly in the newsprint field, came under sharp criticism in a two day conference of Canadian and United States cabinet officials at Ottawa early in January. Canadian complaints resulted in no decisive action, merely an agreement by the United States to continue study of the problem. In various United States investigations, repeated efforts have been made—fruitless—to force Canadian subsidiaries of American paper companies to disclose their relationship toward pricing of newsprint for export to the United States. Canada insists that there was no justification for the effort to make these subsidiaries conform to United States anti-trust legislation without regard for Canadian law.

The United States raised an issue as to the new Canadian anti-dumping legislation. On this point the final communique on the result of the deliberations stated: "It is not intended to apply the new provisions of the Act either in a discriminatory or an arbitrary manner." On this issue also, as with other problems not affecting paper, it was announced that further study would be made of the problem. The new law authorizes Canadian officials to establish arbitrary values for duty purposes on commodities which they deem to be sold in unfair competition with Canadian merchandise. Under the old law additional dumping duties have been levied on some United States paper shipped to Canada, which Canada held was sold at less than the prevailing price in the United States.

Uncle Sam spends more

At a round table conference of Army and paper company officials at Washington, the enormous use of paper, paperboard and paper products by the United States government was graphically portrayed. The Department of the Army alone in 1958 bought paper and paper products to a total value of $9,000,000 through its central procurement agency and an additional $5,000,000 by purchasing agents at scattered individual installations. These figures do not include the many millions spent annually for the packaging of commodities for Army use and cover only one of the main divisions of the Defense Department. All of this comprises a mere fraction of the huge tonnage used by the Government Printing Office and other national administrative agencies. For instance, Uncle Sam has ordered a billion and a half paper towels for the first half of 1959, spending more for this one item than George Washington's entire federal budget.

Apropos of paper towels, a survey of the national market was made by the Tissue Association as the paper industry concluded its fiftieth year of production of this commodity. An estimate for 1959 is that paper towel consumption will reach the huge total of eighty-five billion, or an average of 500 for each man, woman and child in the country.

New system for continuous pulping

The Black-Clawson company has announced the success of a pilot plant operation at the Brown Company's Berlin, N.H. mill. This new system of continuous pulping of hard wood chips which can be used in the production of newsprint may be another step in advance in the utilization of woods once considered impracticable for paper pulp.

World's record set by Bowaters

What is claimed to be the world's record in the production of newsprint was established by the British controlled Bowaters Southern Paper Corp. at its mill at Calhoun, Tenn., when the millionth ton was produced in the company's mill, only one and a half years old, at a speed record of 2510 fpm. The millionth ton was produced by the new No. 4 machine. This is a part of the anticipated increase in North American newsprint capacity of 850,000 tons in 1959 due to the coming into operation of new machines installed in 1958 which did not reach their full potential because of lowered demand.

Research to be discussed

Research will be a major feature of the annual Paper Week in New York with a joint forum of the Technical Association of the Pulp and Paper Industry and the American Paper and Pulp Association at which John Strange, president of the Institute of Paper Chemistry, will be the moderator. Gen. J. M. Gavin who retired from the Army during the furor over the charges that the United States was failing to meet the Russian space challenge will be a leading speaker on the subject "Research in the Space Age." Other speakers will discuss "What Research Expects of Management" and "What Management Expects of Research."

Financial Reports

With stock market values up to an all time high in January, paper mill securities already at high figures kept on an average with other industrial issues.

Net incomes

Longview Fibre Co.—For year ending October 31, $8,294,442; previous fiscal year, $8,784,043. Earnings include $306,-

Fluid Power news

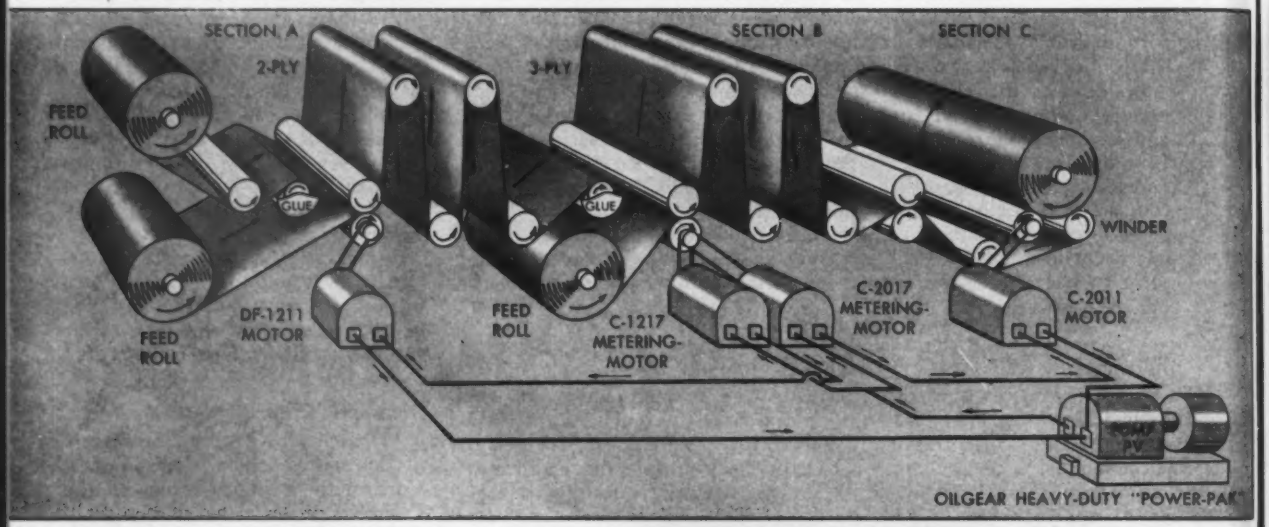
REPORT NO. 12,10
FAST-ACTI
MULTI-STA
DRIVE

From Oilgear Application-Engineering Files

HOW OILGEAR "*ANY-SPEED*" DRIVES SIMPLIFIED MODERNIZATION OF A LAMINATOR

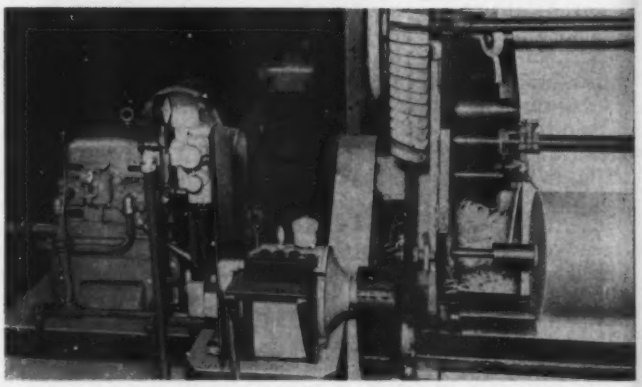
CUSTOMER: *A Large Midwestern Paper Manufacturer*

DATA: This company initiated an extensive equipment modernization program to enable expansion in competitive fields, and increase production efficiency. Part of this program consisted of adding a new section to an Oilgear-powered laminator and winder. *Requirements:* 1: Maintain proportional synchronization and power coordination between existing section and winder with new section. 2: Fast-acting controls for individual, precision, sectional speed adjustments. 3: Start, stop, change speeds rapidly, and run at *any* selected speed to maximum without tearing paper web. 4: Accurate, adjustable, automatic winder tension control. 5: Complete conversion in minimum of machine "downtime." 6: Selected drive must be thrifty on floor space and electrical power.



SOLUTION: Shown above schematically with new section A to left. Oilgear Heavy-Duty, *"Any-Speed"* drives were selected for this application primarily because of space savings, ease and speed of conversion, and long experience with Oilgear's *low-cost-per-year* operational record in their plants. Unusual application feature is the use of a single, Oilgear Size 35 "Power-Pak" as the Fluid Power source for all three exactly coordinated sections of this multi-stage machine. *Performance has proved superior to requested specifications — with no reported maintenance after more than two years of continuous, high-speed service.*

OPERATION: Oilgear type "DE" Variable Displacement Pump (PV) — accurately, remote pushbutton station controlled from zero to maximum output — drives two Oilgear type "C" fixed stroke, constant torque, radial piston motors (C-1217, C-2017). Acting as tandem motors, they power section B. They also act as meters for motors (DF-1211, C-2011) connected in series with them. Oilgear type "DF" variable stroke, constant hp, radial piston motor (DF-1211) powers new section A in series with section B motor (C-1217). Oilgear type "C" motor (C-2011) powers section C in series with section B motor (C-2017). Speed changes initiated from control station pushbuttons to Pump (PV), are imparted to section B, and proportionally to sections A and C. Proportional speed relationship between sections A and B is easily altered by stroke adjustment of motor (DF-1211). Speed relationship between sections B and C is automatically altered as roll diameter increases by an automatic winder tension valve. Maximum torque in section A is independently adjustable. Solenoid-operated brake valves insure rapid, cushioned stops. Rapid, cushioned starts are an inherent feature of Oilgear *"Any-Speed"* drives. This completely sealed, compact, fully pressure lubricated, *"Controlled-Motion System* delivers full rated torque at *"Any-Speed"* . . . automatically conserves electric power . . . quiet, vibration and trouble-free.



View from winder end of laminating machine after a "rush" conversion, completed and running without trouble ahead of schedule. Oilgear Heavy-Duty, Size 35 "Power-Pak" can be seen in left foreground. One pushbutton control station and winder tension valve are to left and in front of series driven, Oilgear type "C" motor which powers the winder section. Oilgear "C-2017" motor, one of the tandem drive metering-motors on the center section, can be seen in center background.

Because of Oilgear's long reputation for cooperative teamwork in solving drive problems with dependable, trouble-free Fluid Power Systems for virtually any application — Oilgear has become a name that all industry trusts . . . and uses.

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Current Comments . . .

994 from timberland sales in 1958 and $245,426 in 1957.

Masonite Corp.—For quarter ending November, $979,787; a year ago, $1,243,040.

Champion Paper & Fibre Co.—For the September quarter, $1,683,719; a year ago, $2,704,650.

Crown Zellerbach Corp.—For nine months, $23,440,000; a year ago, $26,181,000.

Kimberly-Clark Corp.—For six months, $12,880,847; a year ago, $12,481,309.

Oxford Paper Co.—For September quarter, $567,577; a year ago, $753,623.

Rayonier Inc.—For nine months, $1,729,344; a year ago, $4,938,620.

West Virginia Pulp & Paper Co.—For fiscal year ending October 31, $9,575,000; for preceding year sales, $12,694,000.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Jan. 10, 1959	Dec. 10, 1958
American Can	50¼	50¼
Same Pref.	39½	* 39-39¼
Celotex	39⅛	36⅜
Same Pref.	18½	19
Certain-Teed	14¾	13⅜
Champion P & F	42	* 38-38½
Same Pref.	96	97
Chesapeake	* 34¼-35	36¼
Container	29⅛	28½
Same Pref.	* 90-91½	* 91-93
Continental Can	58	56
Same Pref.	* 83-85¼	* 84½-88½
Crown Zellerbach	59	56⅛
Same Pref.	96½	93
Diamond-Gardner	33½	32¼
Same Pref.	31¾	—
Federal Paper Board	52	49½
Same Pref.	21⅜	21¼
Fibre Paperboard	49½	49⅜
Same Pref.	164	159
Great Northern	51½	51
Hammermill	32	31
International	120⅜	115⅜
Same Pref.	92	* 90-91
Kimberly-Clark	65½	69½
McAndrews & Forbes	23½	31⅛
Masonite	40	40⅛
Mead	46⅜	42⅜
Same Pref.	* 93½-95	* 93-95
Minnesota & Ontario	34⅞	35⅜
Oxford	33¼	32⅜
Same Pref.	* 95-96	91½
Rayonier	21¼	20¼
Riegel	35⅞	35¼
St. Regis	44	46¾
Same Pref.	* 96-98	* 93-95
Scott	73½	72½
Same $4 Pref.	* 92-94	* 94-95½
Same $3.40 Pref.	81	* 78¼-79
Sealright	43⅜	42¼
Standard Packaging	29⅞	26⅜
Same $1.60 Pref.	86	* 68½-71
Same $1.20 Pref.	33¼	31¾
Sutherland	40⅜	38½
Union Bag-Camp	43⅜	30¾
United B. & C.	28⅛	27¼
United Wallpaper	8¾	8¾
Same Pref.	* 14⅜-15	* 16½-19
U. S. Gypsum	93½	97½
Same Pref.	* 162-165	158
West Virginia	47	41¾
Same Pref.	* 98-99	* 99½-100½

New York Stock Exchange — Bonds

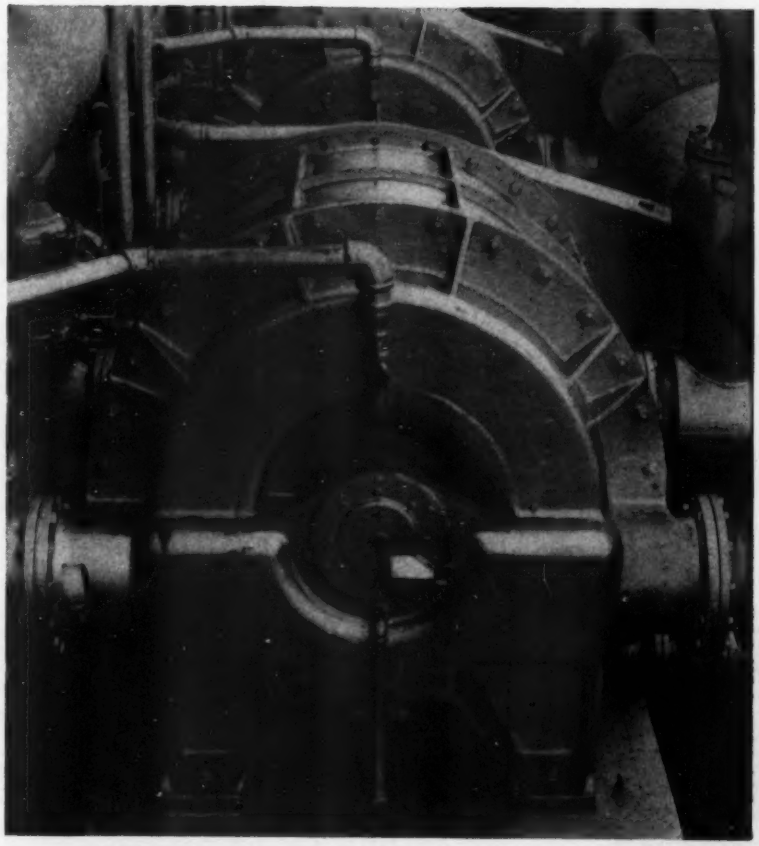
Champion P. & F. 3¾%	—	—
Champion P. & F. 3%	—	—
Diamond Gardner 4%	97	97½
Kimberly-Clark 3¾	—	93⅜
Mead 3%	—	—
Oxford 4¾%	114	111⅛
Scott 3%	106	106½

American Stock Exchange — Stocks

Allied Paper	9⅜	9⅞
American Writing	31¾	32
Brown	14¼	14
Puget Sound	18¾	* 18-18½

*Closing Bid and Asked Prices

High machine speeds?
High temperature headbox stock?
You need NASH Vacuum Pumps!



Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

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RYKON

GREASE

has performed in seven tough applications

In just two years since introduction, **RYKON** Grease has stepped in to deliver lubrication in hundreds of applications where other greases have failed

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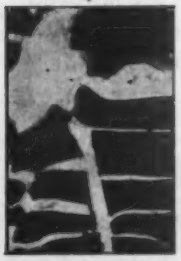

In the process industries where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new type of grease has been needed. RYKON is that grease. Here are just seven examples of how RYKON Grease has performed in tough spots:

Industry	Equipment	Type of Bearings	Conditions	Remarks
Packing Company	can closers	various	high temperature, heavy load, wet	Outperforms previously used greases.
Brewery	washers, conveyors	various	high temperature, wet	Lasts longer and does a far better job on all applications.
Packing Company	canning machines	plain and anti-friction	wet	Very satisfactory.
Chemical Laboratory	washers and degreasers	anti-friction	wet	Better than any grease tested in degreasing solvent.
Automotive Parts Mfr	reciprocating pump bearings	plain	wet	Pumping chemicals. O.K. after one month. Previous grease caused about one bearing failure per week.
Paper Mfr	liquid sulfur pump	anti-friction	high temperature, wet	Has extended life of bearings.
Paper Carton Mfr.	all grease-lubricated parts	various	high temperature, heavy load, wet	Replaced eight different greases. Stays in better.

The reason RYKON Grease can perform under conditions that cause other greases to fail is this: RYKON Grease has a unique non-soap, organic thickener. This thickener holds the oil between its fibers better than any other gelling agent. The thickener is able to withstand extremely high as well as low temperatures. It resists chemical action and remains stable under conditions of severe working and water washing. RYKON Grease has exceptional anti-rust properties.

RYKON Grease's unique properties make it truly multi-purpose. This leads to many worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated and maintenance training and supervisory follow-up is greatly reduced.

More facts about RYKON Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

You expect more from **STANDARD** *and you get it!*

Oven test shows high temperature performance of RYKON Grease. 1. Metal panel coated with RYKON and placed in oven at 350° F. 2. Same panel after five days. RYKON is still soft and ready to lubricate. 3. Another high-melt grease ready for same test. 4. Same panel after oven test. Grease has failed completely.

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"LOW BASIS WEIGHT COATED PAPERS"

With lighter coatings definitely in demand due to higher current postal rates, Mr. P. G. sets a popular style.

His greater adhesive strength, better water holding properties, and correct ink receptivity assure better printing on low basis weight coated papers.

Penick and Ford's Technical Sales Service and Field Development Department is constantly finding new ways to improve the quality of paper. If your problem concerns lightening your paper, we will be glad to help you. Why not call us—today.

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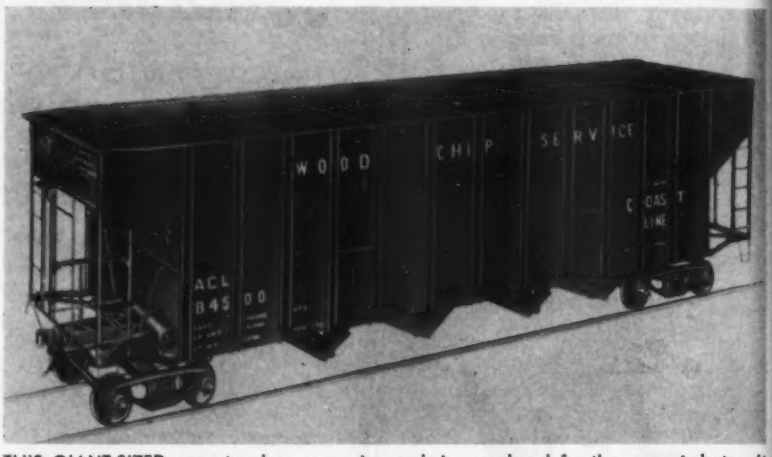
NEWS of the INDUSTRY

Bowaters Achieves Milestone

Bowaters Southern Paper Corp. produced its first millionth ton of newsprint on December 31. This milestone was achieved on the new No. 4 machine which came into operation just two weeks prior to this occasion.

The start-up of this 276-in. machine was an outstanding achievement in the paper industry and also part of the second major expansion program since the mill was completed in July, 1954.



THIS GIANT-SIZED, open-top hopper car is now being produced for the paper industry. It is a completely new design that will be built by Atlantic Coast Line Railroad Co. Breaking the tradition in freight car design, it will provide the paper industry with the newest wood chip hopper car of its capacity in the country. They are more than 15 ft. high, 50 ft. in length and have a capacity of 5400 cu. ft.—about twice that of a conventional hopper car.

Four More Firms Announce the Manufacture of Clupak

Gerald E. Amerman, president of Clupak Inc., has announced licensing agreements of four more firms to manufacture Clupak paper.

International Paper Co.
was the first to sign. The company will install its first extensible papermaking unit on a large kraft paper machine at its Camden, Ark., mill.

West Virginia Pulp & Paper Co.
was the second to sign. This firm, which already is operating a unit on a kraft machine at its Charleston, S.C., mill, will install the second unit on another kraft machine at the same location.

Canada Paper Co.
is the first Canadian licensee of this new process. The unit will be installed on a paper machine at the Windsor Mills, Quebec, plant of Canada Paper.

Halifax Paper Co. Inc.,
a division of Albemarle Paper Mfg. Co., hopes to be in operation soon and will use the new-type paper in special types of sacks and bags where abnormally high stretch is required.

Other companys that have obtained license are Union Bag-Camp Paper Corp., Continental Can Co., St. Regis Paper Co. and Crown Zellerbach Corp.

Clupak Inc. is equally and jointly owned by Cluett, Peabody & Co. Inc. of New York and West Virginia Pulp & Paper Co.

Supercalendering Newsprint

Four Appleton, Wis., firms have worked together in an attempt to improve the quality of standard newsprint by supercalendering.

Appleton Machine Co. approached the publishers of the Appleton Post-Crescent newspaper with the new idea. An experiment was set up using Post-Crescent's newsprint rolls and the supercalender stacks located at Fox River Paper Co. and Appleton Coated Paper Co.

After the newsprint had been supercalendered, it was fed into a regular daily press run at the Post-Crescent with no changes or adjustments made for normal printing procedures.

The results of the experiment proved very promising. Some of the many improvements achieved were: better uniformity of ink distribution on halftones; considerably less fiber "fuzz"; sharper clarity with less ink; improved dry tensile in machine direction, and approximately 20 per cent increase in smoothness. Additional laboratory tests are being conducted to determine the full benefits possible to newsprint users.

Michigan Forms LMPRA

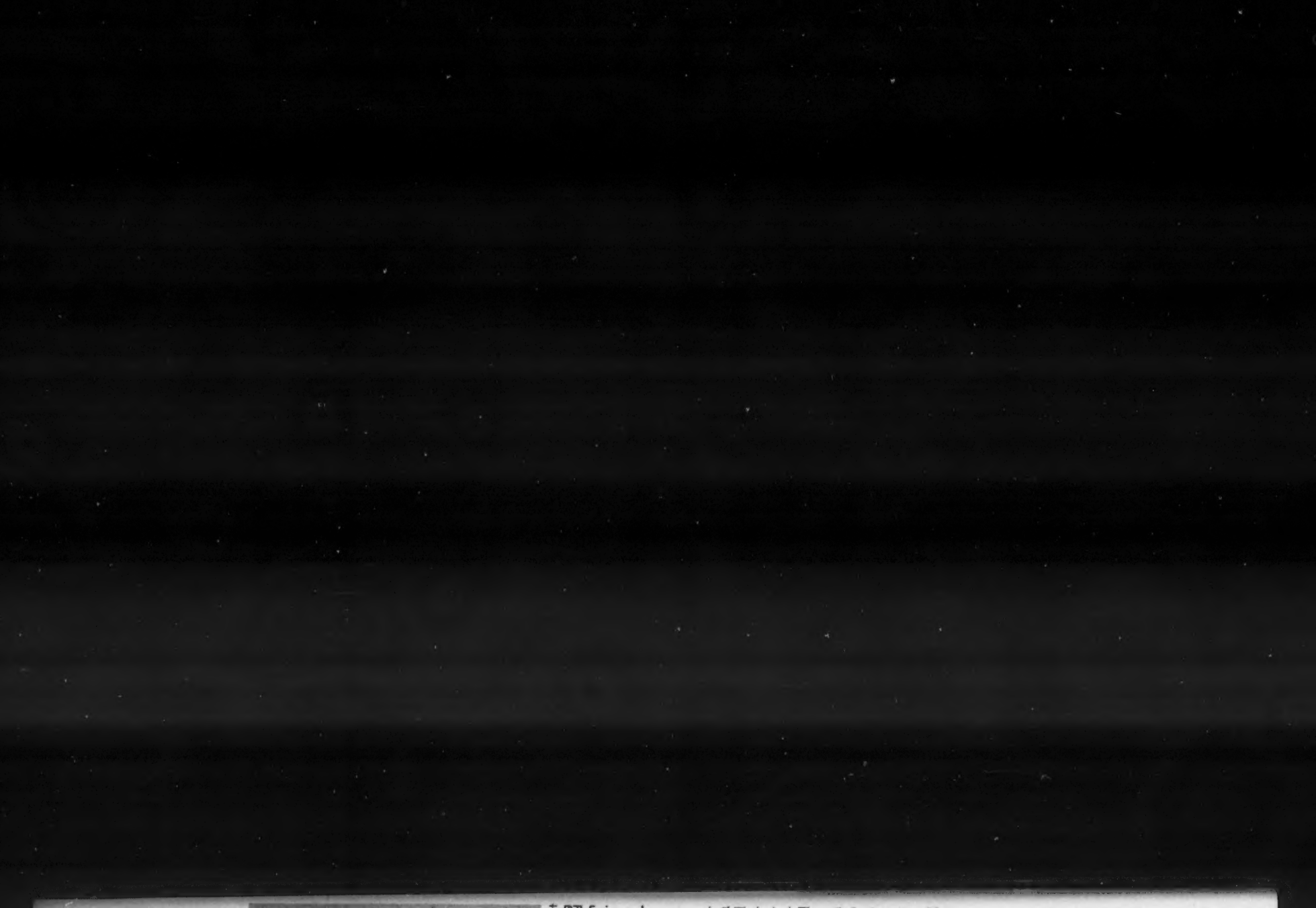
Lower Michigan Pulpwood Research Association (LMPRA) is a newly-formed association founded by officers of pulp and paper companies. The organization will be devoted to the sponsoring of forest research and public instruction related to forest management.

The companies participating in LMPRA and their representatives to the association are: S. D. Warren Co., Muskegon, John N. Fields; Abitibi Corp., Alpena, A. J. Auden; Scott Paper Co., Detroit, Charles G. Allen, and the American Box Board Co., Filer City, Arthur P. Koller and Rowland W. Blair.

Two Firms Change Name

The stockholders of Imperial Paper & Color Corp., Glens Falls, N. Y., have approved changing the company's name to Imperial Color Chemical & Paper Corp. The company manufactures pigment color and wallpaper.

The name of National Metal Edge Box Co. has been changed to Metal Edge Industries. The company, located in Barrington, N. J., produces paperboard and related items.



60"
66"
69"

New... LAWSON Pacemaker Hydraulic Clamp Trimmers

More than 60% faster and 20% heavier than comparably sized guillotines, these amazingly accurate Lawson Pacemaker Trimmers are really new from the ground up! Adjustable center bearing on knife bar... adjustable gibs... rear table-slot closing device... performance-proved hydraulic clamping... built-in air cushion device... truly flexible Adjustable Contour Clamp... exclusive electronic spacing to .002"... no other trimmer offers so many profit-stretching advantages! The Lawson Pacemaker Trimmers are as modern as tomorrow. Write, wire or phone for full details, today.

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Division of Miehle-Goss-Dexter, Inc.

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Recent Expansions in the Industry

Nicolet Paper Constructs New Plant

Nicolet Paper Corp. is constructing a major addition to its paper mill in West DePere. This addition will represent an expenditure of more than $2,000,000 and will house a large new paper machine. The machine will be 340 ft. long and 60 ft. wide and will stand on concrete piers extending over the Fox River. It is a 160-in. wire fourdrinier cantilever machine.

On completion, a large new boiler and stock preparation equipment will also be installed along with supercalendering and rewinding equipment.

Eastman Kodak Plans 1959 Improvement Program

Eastman Kodak Co. announces plans to invest about $61,000,000 in company improvements during 1959.

The expenditures will be used for improved facilities at company plants, research laboratories and offices in Rochester, N. Y., Kingsport, Tenn., Longview, Texas and various Kodak regional sales divisions and units in the United States.

Included in the expenditures budget is about $33,000,000 for the company's Rochester facilities. This includes the Kodak Park Works, where photographic films, papers and chemicals are made.

New Research Center

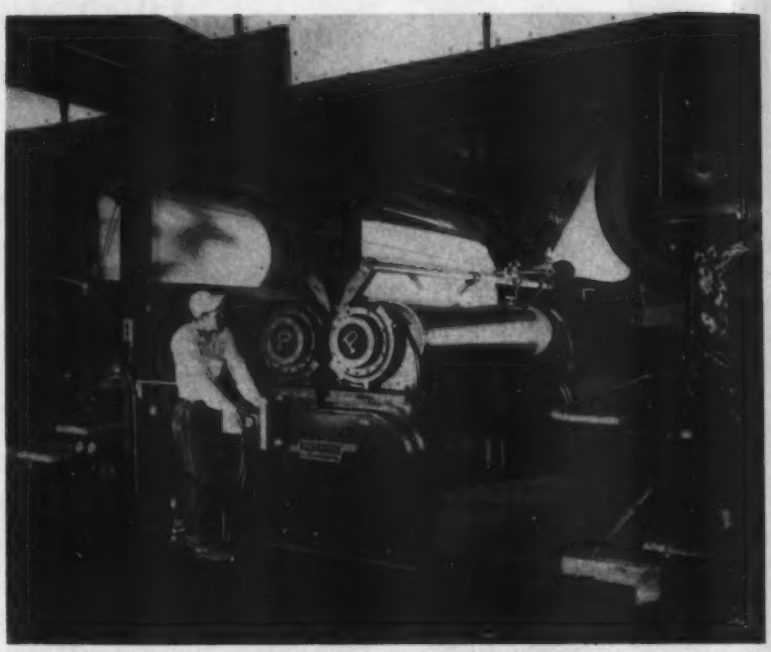
Olin Mathieson Chemical Corp. has opened a new research center and plans an accelerated program of research and product development at its forest products operations.

The new center, called the Frostkraft Research Center, is located at the headquarters for forest products in West Monroe, La. The forest products operations are part of the Packaging Division of Olin.

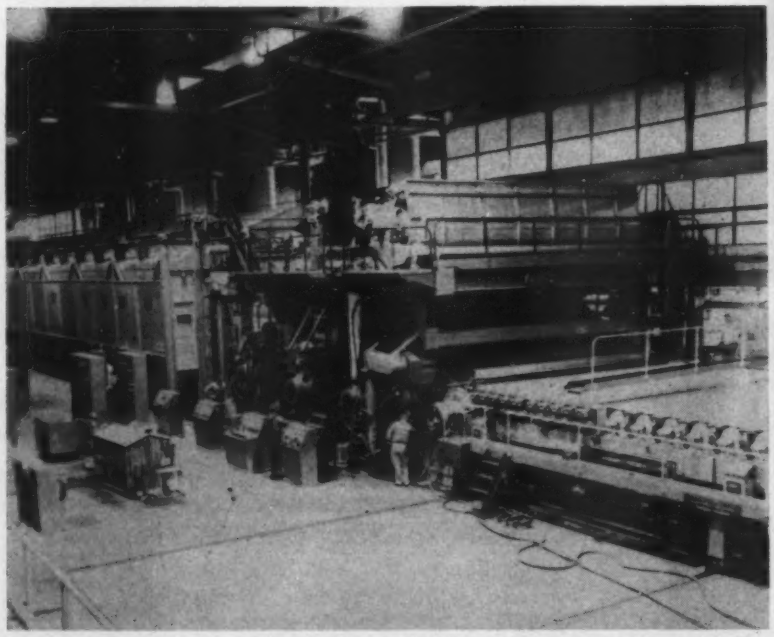
The 12,000-sq.-ft. building houses a pilot plant for paper manufacturing operations, laboratories, testing facilities, a technical library and offices.

Rhinelander Has Merged Into St. Regis

Effective January 1, Rhinelander Paper Co. has been merged into St. Regis Paper Co. and will be established as a separate division of St.



HAMILTON PAPER CO. of Plainwell, Mich., has included this horizontal size press in the modernization of its No. 2 machine. This unit, designed by Patton Mfg. Co. Inc., is an entire after-dryer section consisting of eight dryers and a new Stamm moisture control system for the section. The press is presently equipped with 19 1/2-in. diameter rolls but was built to be eventually equipped with 24-in. diameter rolls.



A NEW 270-in. fourdrinier machine has been installed at Southland Paper Mills Inc., Lufkin, Texas. Built at a cost of $3,000,000 by Pusey & Jones Corp., the machine has a five-suction roll press part and 65 dryers. The fourdrinier wire is 118 ft. long and is equipped with a Pusey & Jones Rapi-Drape wire handling system. The machine is presently producing newsprint at 2500 fpm.

Regis. The new division will be operated as before under the direction of all the former officers.

Rhinelander has just completed a $4.5 million modernization project to improve both steam and electric generating capacity at its Rhinelander location. The project began in the spring of 1957 and has resulted in the construction of a new building to accommodate a new boiler, a water treatment plant and a turbine generator. The company manufactures glassine and greaseproof papers.

New Laboratory at Appleton

The Institute of Paper Chemistry has received a grant of $50,000 from the Louis Calder Foundation for the building of a new laboratory to be known as the Lou Calder plant biochemistry laboratory. Calder is president and director of Perkins-Goodwin Co. of New York and is affiliated with a number of paper manufacturing firms.

Research to study the mechanisms of wood development and to separate and identify the highly-complex building blocks or materials of the three will take place at the new laboratory.

Funds provided by the gift will be used to purchase and install ultracentrifuge and electrophoresis equipment of the latest design. In addition, complete and modern facilities will be provided for freeze-drying biological and biochemical preparations.

March 1 is the date set for completion of the laboratory.

Gas Conversion at Abitibi

Full-scale natural gas service began in two mills of Abitibi Power & Paper Co. Ltd. at Sturgeon Falls and Iroquois Falls, Ont.

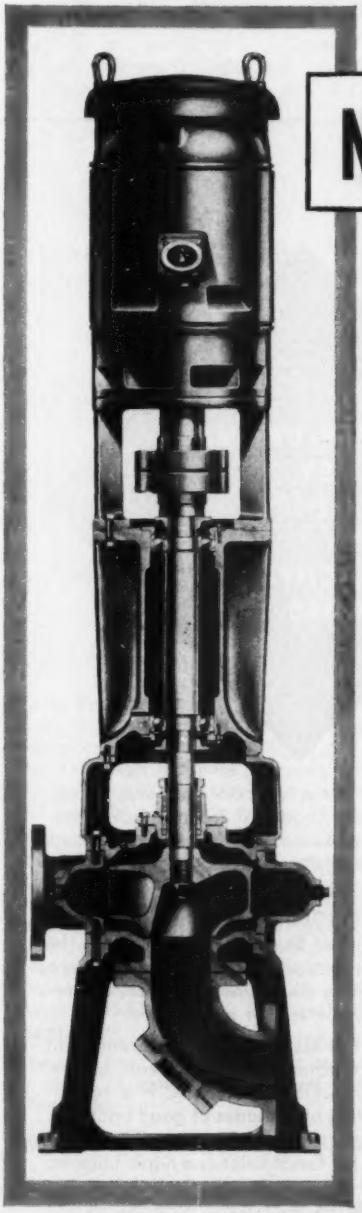
With this conversion work completed, both mills will receive natural gas brought from Alberta via the newly-completed Trans-Canada Pipeline and distributed by Northern Ontario Natural Gas Co. Ltd.

At the Sturgeon Falls mill, the natural gas will be used to fire mill boilers to produce steam for the manufacture of corrugating board, hardboard and platewood building board. In Iroquois Falls, it will assist in the manufacture of groundwood, unbleached sulfite, newsprint, and paperboard.

Both mills will burn gas on a dual-fuel basis, but will retain previous heat source facilities. This enables mill boilers to switch from

For higher pumping efficiency

of solids in suspension!



NEW

Fairbanks-Morse

5440A Non-Clog Pumps

Ideal for pumping unscreened liquids with large solids in suspension

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Here is your answer to higher efficiencies wherever you are pumping solids in suspension!

All-new Fairbanks-Morse 5440A Non-Clog Pumps feature quick, easy convertibility between any of the many vertical and horizontal types. Power requirements of the pump are always perfectly matched to the electrical and mechanical components. Precision-machined centering fits assure accurate alignment. Exclusive F-M bladeless impeller design minimizes maintenance by preventing clogging from solids and stringy material. The 5440A is only one of many F-M solids-handling pumps designed to meet a broad range of requirements. For information, write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Ask for new 5440A BULLETIN!

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COMPRESSORS · GENERATORS · MAGNETOS · HOME WATER SYSTEMS

one fuel to another on short notice, or to burn any desired combination of coal and natural gas.

Installation of gas burners on the boilers, control equipment and measurement devices were involved in the conversion work.

Plan $1,000,000 Expansion

To improve its company's paper mill at Dalhousie, N. B., New Brunswick International Paper Co. is planning to spend more than $1,000,000 during 1959.

The purpose of this year's program is to improve efficiency. The largest item will be the installation of a high-yield sulfite pulping plant built around two digesters.

Existing storage space will be enlarged to provide accommodation for an additional 3000 tons of newsprint. Docking facilities at Dalhousie will also be extended as an increasing volume of newsprint is now shipped from the plant by steamship.

New Converting Plant Opened by Simpson Paper

Simpson Paper Co. of Everett, Wash., has opened its first branch plant.—a new converting plant in Los Angeles. The new plant will manufacture ruled reams, fillers, tablets and allied stationery items.

The plant, a newly-constructed modern single-story building, provides 25,000 sq. ft. of space on 2½ acres of ground. The site is designed for possible expansion to an ultimate 65,000 sq. ft.

At present the operation consists of a ruling machine, trimmer, stripping machine, round corner cutters, paper drills and banding machines with attendant materials handling equipment installed in half of the available space. Aside from necessary office space and facilities in the front of the building, the balance of the area is set aside for raw material supplies and for the storage and warehousing of finished products. The excellent storage facilities with advantageous receiving and shipping arrangements were important considerations in Simpson's decision to locate in this area.

1958 Improvements at Columbia Paper

Continued modernization, plus increased production, keynotes a good year at Columbia River Paper Mills in Vancouver, Wash.

During 1958 the No. 2 papermaking machine was completely overhauled and had improved dryers and a size press added. "It will now produce a higher quality paper", stated the resident manager.

The addition of a machine for the re-dissolving of plup and complete lining of stock chests with tile were among accomplishments.

Other expansion plans such as tearing down old sawmill buildings that are no longer in use are hoped for during 1959.

The firm, with its sister mill—Oregon Pulp & Paper Co. of Salem—specialize in timberline offset paper, safety paper, bond and duplicator and mimeograph paper.

Canadian International May Buy Six Firms

Canadian International Paper Co. may acquire six Canadian companies in the specialty paper field.

This acquisition would mean a major realignment of the wholesale distribution system for specialty papers throughout Canada. Canadian CIP is wholly owned by New York's International Paper Co. and has some 25 subsidiaries operating in Canada.

An announcement is expected shortly in the acquisition of these six companies: Victoria Paper Co., Toronto; Garden City Paper Mills

CHLORANTINE® FAST BLUE P-8GLL

Mill usage of this bright attractive color in bond, offset, mimeo and manifold grades produced from bleached sulphite, bleached neutral sulphite semi-chemical and bleached sulphate pulps has repeatedly shown marked economy in formulations for blue and green shades.

Chlorantine Fast Blue P-8GLL is somewhat greener in shade than our Direct Brilliant Sky Blue P-6B Ex. Conc. Its shade and strength permit partial replacement of the more expensive Alizarine Sapphire Blue types to effect appreciable economy without undue loss of brilliance.

Chlorantine Fast Blue P-8GLL possesses excellent light fastness, good fastness to water, acid and alkali, and is easily discharged with hypochlorite solutions. It is recommended for dyeing appealing blue shades of good brilliance on specialty converting papers ranging from tabulating card and file folder stocks to facial, facial toilet and napkin tissues.

We shall be pleased to furnish information on mill-proved formulations showing marked cost reduction over dyes in general use for many blue and green shades.

CIBA Company Inc., Paper Chemicals Department
627 Greenwich Street, New York 14, N.Y.

Co., St. Catharines, Ontario; Canadian Vegetable Parchment Co., Merritton, Ontario; Monarch Papers Ltd., Toronto; Mid-West Paper Ltd., Winnipeg, and Vancouver Pacific Paper Co., Vancouver.

Consolidated WP&P to Build Research Unit

Plans for the construction of a $200,000 research and development building have been approved by the board of directors of Consolidated Water Power & Paper Co. in Wisconsin Rapids, Wis.

Designed to accommodate expanded research and development activities, the structure will eventually be expanded into a three-unit facility.

Ohio Boxboard Co.

of Rittman, Ohio, announces that construction will soon begin on a corrugated container plant in Lancaster, Penn. The plant will be equipped with a 78-in. corrugator and related equipment for an annual output of 250,000,000 sq. ft.

National Vulcanized Fibre Co.

of Wilmington, Del., and Parsons Paper Co., Holyoke, Mass., have approved a plan where National will acquire Parsons Paper. When the transaction is completed, the paper company will become the Parsons Paper Division of National Vulcanized Fibre Co.

F. N. Burt Co. Inc.

of Buffalo, N.Y., will be moving into its new plant in suburban Cheektowaga in May or June. More than $500,000 is being spent for new equipment for this new plant. The company is a cardboard box manufacturer.

Union Bag-Camp Paper Corp.

has completed plans for the construction of a corrugated box plant in Spartanburg, S. C. The building area is 136,000 sq. ft. It is scheduled to go into production in December 1959.

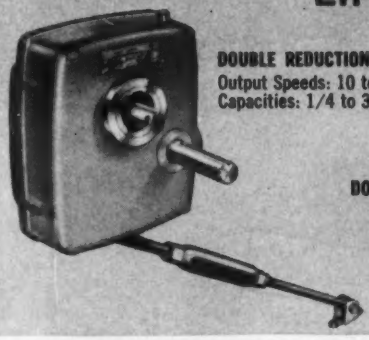
Continental Can Co. Inc.

will soon begin building a large plant south of Augusta, Ga. The plant will produce 350 tons of bleached sulphate paperboard and paper a day. It will be supplied with wood by its

AVAILABLE FROM LOCAL STOCK

FOOTE BROS. SHAFT MOUNTED DRIVES WITH Duti-Rated® LIFETIME GEARING*

SINGLE REDUCTION
Output Speeds: 90 to 420 RPM
Capacities: 1/4 to 40 HP

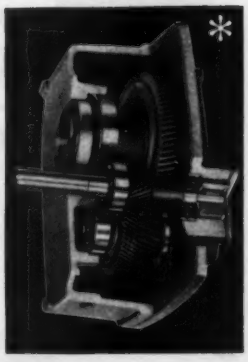


DOUBLE REDUCTION
Output Speeds: 10 to 160 RPM
Capacities: 1/4 to 30 HP

DOUBLE REDUCTION FLANGE MOUNT
Output Speeds: 10 to 135 RPM
Capacities: 1 to 7 HP

Foote Bros. Shaft Mounted Drives offer more efficient, more economical, power transmission. They incorporate exclusive Duti-Rated Lifetime Gearing — the high hardness, balanced design, premium quality gearing that combines greater load carrying capacity with long service life.

Used with standard V-Belts and Sheaves, Foote Bros. Shaft Mounted Drives will provide virtually any output speed you may require. Quick, easy installation on driven shafts with diameters from 15/16" to 3-7/16" saves time, labor . . . eliminates need for reducer mounting, couplings, and adjustable motor mount. Built-in Backstop to prevent reverse rotation, Automatic Overload Release Torque Arm, Variable Pulley, are available as optional equipment.



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own timberlands and Georgia and So. Carolina timberlands as well.

West Virginia Pulp & Paper Co.
will continue further expansion of its converting operations. Nearly $33\frac{1}{2}$ million in plant additions during 1958 had been invested and a comparable outlay is projected for 1959.

Provincial Paper Ltd.
will start on a general expansion of manufacturing facilities at Toronto, Ont. The installation of a trailing blade coater is slated in the program. Provincial is a wholly-owned subsidiary of Abitibi Power & Paper Co. Ltd.

Bemis Bros. Bag Co.
has leased a 21,000-sq. ft manufacturing facility at Fullerton, Calif. The building will be used for the production and distribution of specialized industrial paper bags.

C. H. Dexter & Sons Inc.
has assumed ownership of Standard Insulation Co. of East Rutherford, N. J. and will operate it as a wholly-owned subsidiary under the name of Standard Insulation Co. Inc. Standard specializes in the coating, lamination and impregnation of paper, fabric, glass cloth and foil. There will be no change in production or sales policies and the firm's plant and offices will stay in East Rutherford.

Appleton Coated Paper Co.
plans to build 200- × 100-ft. addition to its sorting room at Appleton. It will be a one-story building with basement storage areas.

Standard Packaging Corp.
of New York has announced the acquisition of Chemical Paper Mfg. Corp. of Holyoke, Mass. Chemical Paper will operate as the Chemical Fine Paper & Board Division of Standard Packaging Corp. under the direction of Chemical's present management.

National Gypsum Co.
is considering the acquisition of Olean Tile Co. Inc. of Olean, N. Y. Olean will operate with the American Encaustic Tiling Co. as a subsidiary of the National Gypsum. The firm's products will continue to be sold to its present customers under its tradename through the American-Olean Tile Co.

Prairie Fibreboard Ltd.
plans a $750,000 expansion of its Saskatoon, Saskatchewan plant. This will increase plant capacity and provide for production of additional specialty softboard and hardboard products.

Container Corp. of America
has leased the New Bedford, Mass. paperboard mill of Atlantic Carton Corp. The mill boasts a 72-in. five-cylinder machine and a 110-in. six-cylinder unit and has a daily capacity of 100 tons. The plant has been idle for several months, and extensive reconditioning will be necessary prior to operation.

Narrow Fabric Co.'s
Wyomissing Paper Products Div. at West Reading, Pa., will construct a 150,000-sq. ft. plant for the expansion of its production of flint, glazed and cloth-lined papers. The new facility is designed to modernize and better

Kalamazoo Glazed Tile Tanks
Designed for the Paper Industry

6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION
Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

integrate all production and materials handling functions on a straight-line basis.

Somerville Ltd.
of London, Ont., has installed new equipment for the expanded production of its "Ezy-Carry Pak" beer container. The white kraft board package is being supplied to John Labatt Ltd.

International Paper Co.
has announced plans to build a new paper milk container plant in Versailles, Ky. The plant is scheduled to start operations this fall. It will have a capacity of about 35,000,000 containers a month.

Europa Carton AG,
European subsidiary of Container Corp. of America, has added a seventh plant to its German operations through the acquisition of Bremer Papier und Wellpappenfabrik AG of Bremen.

Edwin J. Schoettle Co. Inc.,
Philadelphia folding carton manufacturer, has under construction a $1,300,000 plant in Upper Gwynedd Township, a suburb of the Pennsylvania city. The 156,500-sq. ft. building will boast 25 per cent more usable space than was available at the firm's eight-story "downtown" location.

Anglo-Newfoundland Development Co. Ltd.
has recently modified its sulfite screening system. Automatic stock tank level controls and consistency regulators, tiled tanks and troughs, stainless steel pipes and headboxes have made the operation more efficient.

Scott Paper Co.
has leased an additional 20,000-sq. ft. of space in the former Yorkshire Worsted Mills at Lenni Mills, Pa. This makes a total of 60,000 sq. ft. occupied by the firm at this location. The space is being used for experimental and manufacturing purposes.

Tennessee River Pulp & Paper Co.
has exercised options on land for a plant site at Counce, Tenn., where the firm plans the construction of a 500-ton-per-day kraft pulp and containerboard mill.

(Continued on page 768)

In Dust Collection Systems...

SF Precipitator at a steel plant.

design makes the difference

Higher efficiency of Buell 'SF' Electric Precipitators is the result of exclusive engineering features. For example, Buell's *Spiralectrodes* emit 50% to 100% more electrons than other types . . . and *maintain* their efficiency. Positive gas flow control through adjustable baffles prevents scouring and eddying. And Buell's Unique Continuous Cycle Rapping practically eliminates "puffing".

BUELL CYCLONES

Lower installation cost of Buell's time-proved simplified design makes erection faster and easier. Spiralectrodes, for example, are self-tensioning, require no weights. Flexibility of power supply means easier installation, operating safety.

"SF" ELECTRIC PRECIPITATORS

Lower maintenance cost is the result of many details of superior design. And sectionalized design permits shutting down part of a unit without interrupting service in the rest of the unit.

Get full information: write for a copy of "Buell SF Electric Precipitators", a 22-page booklet. Write to Dept. 56-B, Buell Engineering Co., Inc., 123 William Street, New York 38, N. Y.

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Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

WEIGH THESE FEATURES

against ANY YARD CRANE you can buy!

The best testimonial to Northwest Crane performance is the high output and smooth trouble-free operation that the many mills using them are getting. Northwests bring you outstanding advantages that mean dependability, speed and greater safety in the pulpwood yard.

- Rugged Cast Steel Machinery Bases that assure the rigidity that maintains shaft alignment and reduced wear along with the stamina that takes the shock of heavy loads.
- Long crawlers that are easily steered without tearing up roads and storage areas. Positive Traction on both crawler belts while turning as well as when going straight ahead takes a Northwest anywhere around the mill.
- Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and bring greater accuracy to spotting loads to conveyors, cars and trucks. No inside or outside band clutch can be a Uniform Pressure Clutch.
- The "Feather-Touch" Clutch Control gives ease of operation with a *true* feel of the load. No pumps, compressors or valves to shut you down.
- A choice of boom hoist equipment to meet your need—The Northwest Standard Worm Boom Hoist or the Northwest Independent High Speed Boom Hoist, independent of all other machine operations. Both have the added safety feature of operating with power *both up and down*. The Northwest Independent High Speed Boom Hoist gives you controlled high speed operation where constant booming is a requirement.

These are just a few of the outstanding Northwest advantages that make it a finer piece of equipment. Northwest has new things to tell you about. Ask a Northwest man to bring you up-to-date.

NORTHWEST ENGINEERING COMPANY
1508 Field Bldg., 135 South LaSalle Street
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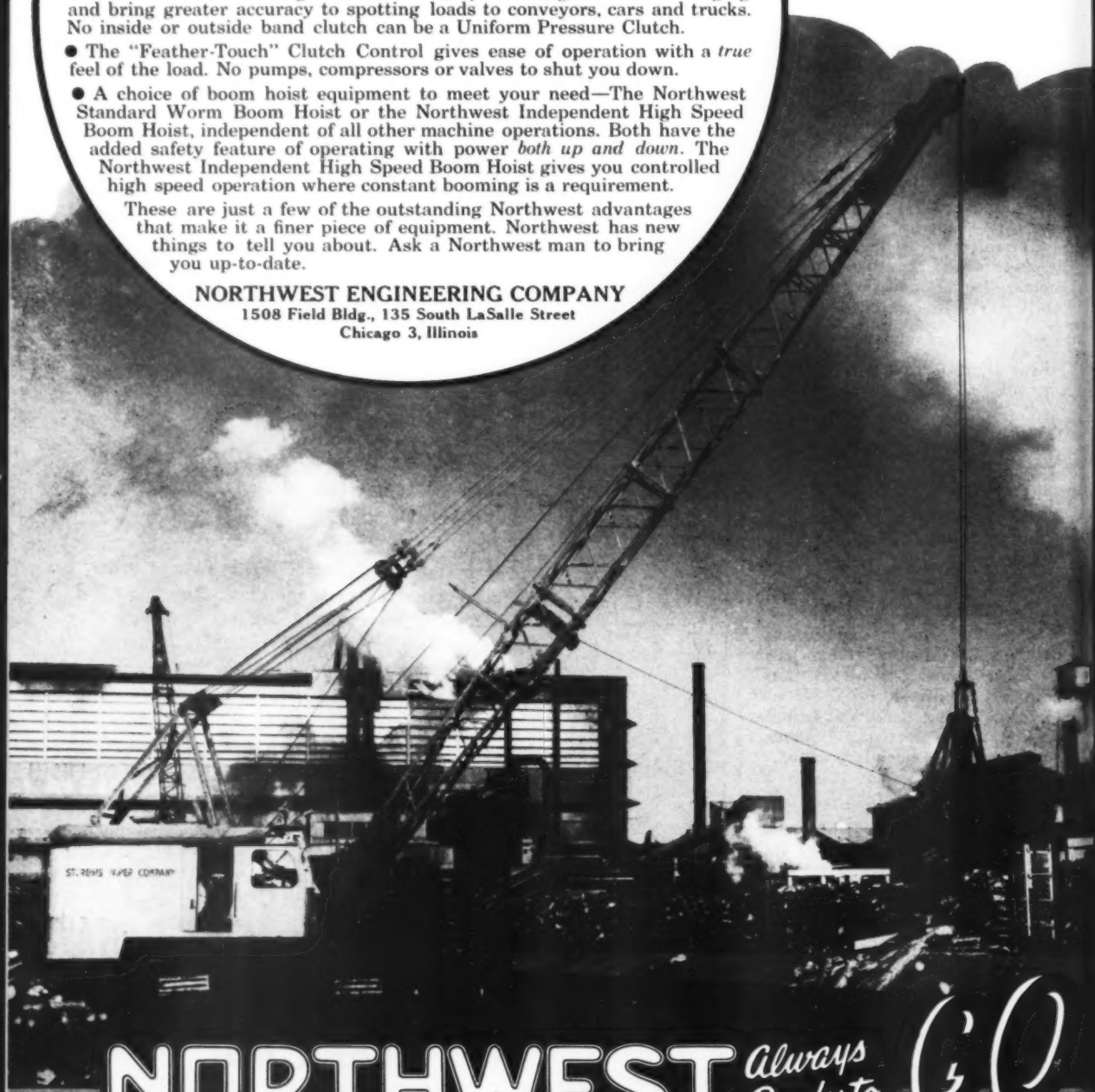


NORTHWEST *Always Ready to* GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	10-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

NAMES in the NEWS

Elderkin receives TAPPI Medal

Karl O. Elderkin, president of Bowaters Research & Development Inc., Calhoun, Tenn., has been selected by the executive committee of the Technical Association of the Pulp and Paper Industry to be the 27th TAPPI medallist.

This medal is awarded to an individual who has made outstanding contributions toward the technical advancement of the pulp and paper industry.

Elderkin was employed by such companies as St. Lawrence Paper Corp., Price Bros. & Co. Ltd., Abitibi Power & Paper Co. Ltd., and Canadian International Paper Co. From 1939 to 1952 he was manager of the Crossett Paper Mills. In 1952 he became vice president and general manager of Bowaters Southern Paper Corp.

Among many of his accomplishments, was the design of the Allis-Chalmers stock pump. He also pioneered the vacuum transfer for light-weight kraft and newsprint machines for high-speed operation.

Elderkin was president of TAPPI in 1955 and 1956.

Ehrhart Retires as President

E. O. Ehrhart has retired as president of Armstrong Forest Co., a subsidiary of New York & Pennsylvania Co. Inc.

Ehrhart has had a long and distinguished career of 41 years in forestry, both inside and outside of his company. He has been intimately connected with many developments that have become standard practice in the management of woodlands and in the pulpwood industry.

In addition to his role as a forest management pioneer, Ehrhart's World War I training as a naval aviator led him (in the early 1920's) to explore the possible applications of aerial photography as a forestry tool. As a result of this early interest, Armstrong became the first American company to make large-scale commercial use of air photos for mapping timberland.

L. W. Sutherland

William Race

Sutherland Retires

L. W. Sutherland, chairman of the board and founder of Sutherland Paper Co., Kalamazoo, has announced his retirement.

Sutherland has headed the company for 41 years. He was elevated from president to the chairmanship in 1942. He will remain a member of the board of directors as well as chairman of the executive committee.

Sutherland, along with his brother Fred, founded the firm in April 1917 under the name of Kalamazoo Sanitary Carton Co. Beginning with 10 employees, the company has grown to a multi-million dollar packaging and paper specialties concern with over 4000 employees.

William Race, present president, will now assume the positions of chairman of the board and chief executive officer.

E. Wendell Smith, formerly secretary-treasurer of the company was appointed president.

B. C. White was appointed treasurer and will continue his duties as controller.

C. W. Walton, manager of the legal and patent department, was appointed secretary. C. W. Lawrence was named assistant secretary.

Jones Appointed at Fort Orange

Robert P. Jones has been appointed executive vice president and general manager of Fort Orange Paper Co. at Castleton-on-Hudson, N. Y. (a wholly-owned subsidiary of Sutherland Paper Co.). Jones, who has been vice-president in charge of sales and assistant secretary at Fort Orange will succeed the late Gaylord Beason.

E. Wendill Smith

John Ditmyer

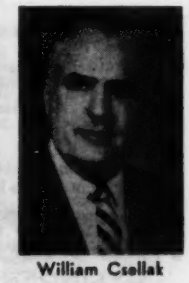
Ditmyer Retires as Superintendent

John Ditmyer, superintendent of Diamond Gardner Corp.'s Mill I in Middletown, Ohio, has retired after 58 years of service in the paper industry.

Ditmyer was in his teens when he started in 1900 with the newly-born Colin Gardner Paper Co. (now the Gardner Div.). He rose from cutterboy to back tender to machine tender, and then to foreman and superintendent. His service as superintendent is said to be among the longest, if not the longest, in the industry.

Ditmyer recalls that at the beginning of his career, there were very few electric lights. Hand torches and kerosene lamps were used as lighting aids. All machinery was steam driven. He also recalls that his first pay was $7.00 a week for 12-13 hrs. work and six days a week. Sunday work, however, would net an extra half day's pay.

Duncan Brown



William Csellak

VPs Announced at Diamond Gardner

Duncan S. Brown and William R. Csellak have been appointed vice

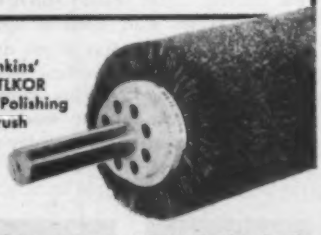
PRIVATE EYES

Jenkins' METLKOR brushes, teamed with Viking's Void Detector, check every inch of paper as it is made, find holes, measure them, count them, record them, pinpoint their positions and signal the operator, all automatically. The Jenkins' feeler brush, a critical part of the system, sends a low voltage pulse to the Viking Indicator Unit whenever a hole appears.

John Glump, Vice-President of Viking Instruments, Inc., of East Haddam, Conn., says: "Jenkins' brushes do a superb job for us. They are an improvement on 13 counts:

1. Improve accuracy of flaw detection.
2. Have no abrasive effect on product.
3. Eliminate lint problem.
4. Outlast previous brushes 3 to 1.
5. Made exactly to size, no cutting or alterations necessary.
6. Simplified mounting.
7. Improved construction.
8. Superior bristles.
9. Refillable when bristle is worn.
10. More economical.
11. Free engineering service.
12. Speedy solution to problem.
13. Quick delivery."

Jenkins' METLKOR Paper Polishing Brush



Jenkins' also makes the following brushes for the paper industry:

Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Static Elimination • Flocking • Felt Cleaning • Feed or Carrier • Paint Brushes • Floor Sweeps

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the original . . . the best *Metal Core* brush

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CYLINDER BRUSHES
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Names in the News . . .

presidents at the Gardner Div., Diamond Gardner Corp. of Middletown and Lockland, Ohio.

Brown becomes vice president of manufacturing paperboard for the Division's three mills at Middletown and Lockland.

Csellak will be vice president of manufacturing cartons. He is responsible for the manufacture of cartons and retail boxes at the company's fabricating plants located at Middletown and Lockland.

Changes at Riegel

A realignment of executive responsibilities has been made at the Carolina Division of Riegel Paper Corp.

Dr. A. L. M. Bixler has been named manager of manufacturing services. A. L. Wiley will continue as assistant to Dr. Bixler.

J. D. Dailey was made manager of pulp and paper production. In addition to this, he will also be responsible for the maintenance, wood, power, electrical and instrument departments.

J. R. Compton will now be responsible for all accounting and controller functions as division controller.

Other promotions were: C. C. Peters to assistant manager of production; T. J. Kayhart to chief engineer and R. O. Brandt to power plant superintendent.

Stevens Retires from Marathon

John Stevens, president and chairman of the board of Marathon Corp., Menasha, Wis., has retired as an officer and director of the company. His resignation was effective before Marathon's merger with American Can Co. last December.

Stevens said after 44 years in the paper industry that he was anxious to be relieved of his executive responsibilities. However, he will continue to serve the company as a consultant, with particular interest in the paper field with which the Marathon Division of American Can is associated. Stevens will maintain an office at Appleton.

He joined Marathon as plant manager at Ashland in the fall of 1929. He was elected to the firm's board in 1933. He was elected president of a Marathon subsidiary (Marathon Paper Mills of Canada Ltd.) in 1946, and in 1952 became president of Marathon Corp. He was named chairman of the board four years later.

Sigler Elected VP for Container

Paul E. Sigler has been elected a vice president for Container Corp. of America. His responsibilities will now include: manufacturing; correlation of new projects; quality programs; operating procedures; cost controls and engineering in northern linerboard and corrugated medium mills.

With headquarters at Carthage, Ind., Sigler will be associated with mills at: Wilmington, Del.; Noblesville and Carthage, Ind.; Circleville and Cincinnati, Ohio; Ogden Ave., Chicago and 57th St., Los Angeles.

Four Appointments Announced at Fibreboard

E. W. Carey has been appointed vice president of marketing. He will assume the responsibilities of B. P. Altick, who is taking a leave of absence. Carey had been vice president of administration for Fibreboard.

Two manufacturing appointments were also announced. J. F. Havard continues as vice president and will now be in charge of engineering and resources. George Burgess, formerly project director, has been appointed general manager of the manufacturing division.

Joseph B. Fagot was appointed general manager of administration division, assuming staff functions formerly held by Mr. Carey.

Russell M. Mather has been appointed to the newly-created position of general manager of the Boxboard Division of Stone Container Corp. His responsibility will be for the company's boxboard mills at Franklin, Ohio and Mobile, Ala. His office will remain at Franklin where he has been mill general manager for three years. **J. R. Boykin** will also continue as resident manager of the Mobile mill.

Hammermill Paper Co. of Erie, Penn., has announced the election of **Fred E. Bahrenburg** as vice president and his appointment to the newly-created position of manager of mills and also the promotion of **Robert S. Young** to the newly-created position of manager of mill operations at the Erie Division.

Bahrenburg, who is a Hammermill director, was formerly plant manager of the Erie Division and will continue as general manager of the Watervliet Paper Co., a Hammermill division located at Watervliet, Mich. Young was formerly general superintendent of the Erie mill.

Otto Ohliger, former assistant superintendent of the Washington, Pennsylvania Division of Federal Paper Board Co. Inc. has been promoted to Federal's Lindley Box and Paper Division at Marion, Ind. At this post, he will be in charge of carton manufacturing operations.

Max J. Schneider has been elected chairman of the board of Angel Soft Tissue Mills Inc. In the same election, **Edward J. Gould** was named president to fill the vacancy created by the recent death of **Nat. E. Heit.**

A. W. Dufrechou, vice president of Sales for Kohlmann Box Co. Inc., New Orleans, has been elected a director of Fibre Box Association.

Allied Personalities

Daniel Fulton will be the manager of the new district sales office in Houston, Texas, for Roots-Connersville Blower, Connersville, Ind. (a Division of Dresser Industries Inc.) Fulton has been with Roots-Connersville since 1948. He will assume responsibility for the organization and management of the Houston territory.

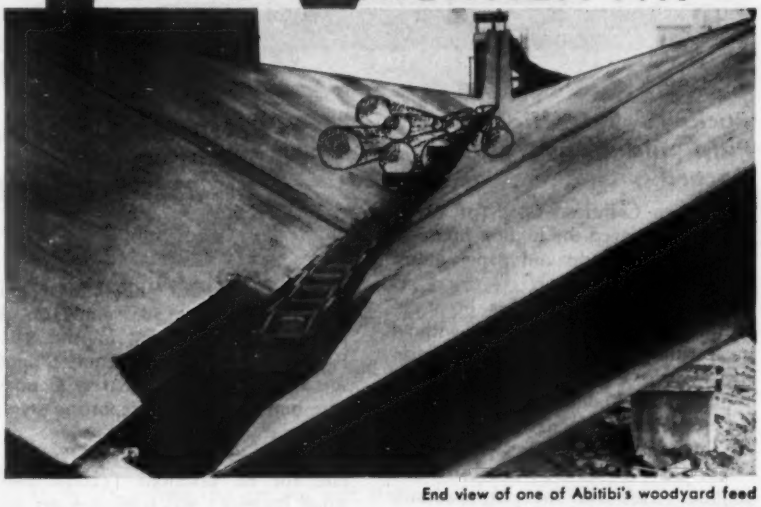
Chicago Bridge & Iron Co., Chicago, has announced the transfer of four sales engineers and the appointment of a new superintendent. **Richard D. Ayers,** formerly of the Chicago sales office has been assigned to the Boston office. **Robert L. Blandford,** formerly of the Chicago office will be transferred to the Tulsa sales office. **James T. Dunn** has moved to the Philadelphia sales office after several years in Chicago. **Donald F. Simons** has been assigned to the Chicago office. **William C. Roberts** has been appointed superintendent of the company's Greenville, Penn., plant.

T. E. Detcher has been appointed manager of sales for the John W. Rouse Construction Corp. of Gouverneur, N. Y. He will direct a program designed to acquaint cus-

(Continued on page 790)

PV

PLANET VERSATILITY...



End view of one of Abitibi's woodyard feed conveyors. Note control tower in background.

1300-FOOT LOG AND CHIP HANDLING SYSTEM *DELIVERS 50 CORDS PER HOUR*

When Abitibi Corporation decided to install a log handling system at their new Alpena mill, they consulted Planet Corporation's materials handling experts. Their problem was to devise a system that would cover 1,300 feet and deliver 50 cords of pulpwood per hour from the woodyard, through the barking and chipping operations, to the storage silos.

Planet engineers solved the problem with a double feed system of troughed, single strand chain conveyors which start from opposite ends of the woodyard and carry the logs to the barker house. To eliminate jamming at the barkers, unique automatic fall out stations were designed to drop excess logs off the mainline conveyors to be recirculated later. From the barkers, the logs converge onto a powered, spike-roller conveyor which transports them to the chipper house. Holdback units within this conveyor prevent jamming in the chipper feed spouts. The wood chips drop onto a belt conveyor which carries them to a bucket elevator where they are lifted to a long, covered troughed belt conveyor. This conveyor speeds the chips across the mill roof to the storage silos. This entire system, built and installed by Planet, is controlled by five operators.

PLAN WITH PLANET

If you have a materials (bulk or unit) handling problem, let Planet demonstrate how its versatile engineering skill and know-how can help you. It paid Abitibi to "Plan with Planet," *it will pay you too to use Planet Versatility.* Write or phone today!

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SAFETY NEWS

Buckeye Sets Highest Pulp and Paper Safety Record

Buckeye Cellulose Corp. of Memphis has achieved the highest honor in safety for the pulp and paper industries.

The Memphis plant has been operating since January 22, 1956 without a lost-time accident. This achievement surpasses the former industry record of 3,770,086 man-hours, which was set several years ago by Dixie Cup Co. of Easton, Penn.

On June 13, 1958, Buckeye set the highest record for the pulp industry with 3,181,783 man-hours. This new record is an extension of the pulp record but covers both the pulp and paper industries.

• • •

Owens-Illinois Breaks All-time Safety Record

An all-time record for safety in the paper board industry has been set by Owens-Illinois Glass Co. (Mill Div.), Valdosta, Ga.

The company achieved this record with 2,129,952 man hours without a lost time accident and within a period from March 3, 1957, to January 1958. The record was broken on the 668th day when a machine tender dropped a metal pole, which injured a finger.

Georgia Kraft Co. of Macon, Ga., previously held this record with 2,124,207 injury-free man hours.

• • •

Glatfelter Wins Regional Award

The American Paper and Pulp Association has awarded the Regional Safety Award to P. H. Glatfelter Co. of Spring Grove, Penn.

This award is made to the paper mill having the lowest frequency rate, based upon the accident experience of Middle Atlantic regional mills over the last five years. There were 66 mills representing this area.

The company qualified for the award during a period of an exceptional growth of the company's employment.

Mills are Still Reporting a Downward Trend in NSC Contest

FOR THE ELEVEN MONTHS ended November 30, some 106 reported perfect scores in the 1958 Paper Industry Safety Contest sponsored by the National Safety Council. The number of mills reporting stands at 676.

The January-November frequency rate for all divisions (except pulpwood logging) was 6.96, a 4 per cent decrease from the same period in 1957. In the Pulp & Paper Div. the 11-month rate was 6.49, a decrease of 8 per cent from a year ago. In Paper Converting a rate of 8.01 meant a 2 per cent increase from a year ago. Pulpwood Logging reported a rate of 35.53, a 56 per cent decrease from last year.

Contestants working the most man-hours in the January-November period without lost-time accidents were: Marinette Paper Co. (a subsidiary of Scott Paper Co.), Marinette, Wis.; Owens-Illinois Glass Co. (Mill Div.), Valdosta, Ga., and Chesapeake Corp. of Virginia, West Point, Va.

From the eligible mills in Division I the board of judges will choose the mill with the most outstanding record. This plant will be awarded the grand prize—the Edward Benton Fritz Memorial Trophy—during the National Safety Congress in October. The trophy is presented each year by Fritz Publications Inc., publisher of THE PAPER INDUSTRY.

Perfect scores recorded for the January-November period were as follows:

Division I—Pulp & Paper Mills

Group A

No perfect scores.

Group B

Marinette Paper Co., Marinette, Wis.; Owens-Illinois Glass Co. (Mill Div.), Valdosta, Ga.; Chesapeake Corp. of Virginia, West Point, Va.

Group C

Schmidt & Ault Paper Co., York, Pa.; Fraser Companies Ltd., Newcastle, N. B.; Falls Paper & Power Co., Oconto Falls, Wis.; Canadian Johns-Manville Co. Ltd., North Bay, Ont.; Pacific Coast Paper Mills of Washington Inc., Bellingham, Wash.

Group D

Certain-Teed Products Corp., East St. Louis, Ill.; Mead Corp., Sylva, N. C.; Congoleum-Nairn Inc., Cedarhurst, Md.; United States Gypsum Co., Oakmont, Pa.; United States Gypsum Co., Clark Township, N. J.; Central Fibre Products Co., Tama, Iowa; Celotex Corp., Los Angeles.

Group E

Johns-Manville Co. Ltd., Asbestos, Que.; United States Gypsum Co., North Kansas City, Mo.; Fibreboard Paper Products Corp. (board mill), Sumner, Wash.; St. Regis Container Co. (Muskingum Mill Div.), Conshocton, Ohio; Flintkote Co., Lockport, N. Y.; Flintkote Co., Little Ferry, N. J.; Scott Paper Co., Madison, Maine; Celotex Corp., Madison, Ill.; St. Regis Paper Co., Herrings, N. Y.

United States Gypsum Co., Gypsum, Ohio; Riegel Paper Corp., Riegelsville, N. J.; American Writing Paper Corp. (Gill Div.), Holyoke, Mass.; Container Corp. of America, Wilmington, Del.; Crown Zellerbach Corp. (Gaylord Container Corp. Div.), Dresden, Ohio; Rogers Corp., Manchester, Conn.; Spaulding Fibre Co. Inc., Milton, N. H.; Rayonier Inc., Shelton, Wash.

Division II—Paper Converting

Paper Bags

Union Bag-Camp Paper Corp., St. Louis; St. Regis Paper Co., Nazareth, Pa.; St. Regis Paper Co., Ltd., Vancouver, B. C.; Pillsbury Mills Inc., Wellsburg, W. Va.

Boxes and Cartons

Group A

Fibreboard Paper Products Corp., Stockton, Cal.; Container Corp. of America, Valley Forge, Pa.; Crown Zellerbach Corp., (Gaylord Container Corp. Div.), Atlanta; Green Bay Box Co. (Corrugated Div.), Green Bay, Wis.

Group B

Container Corp. of America (Folding Carton Plant), Philadelphia (Manayunk), Pa.; Container Corp. of America (Boyle Ave. Plant), Los Angeles; Container Corp.

(Continued on page 768)

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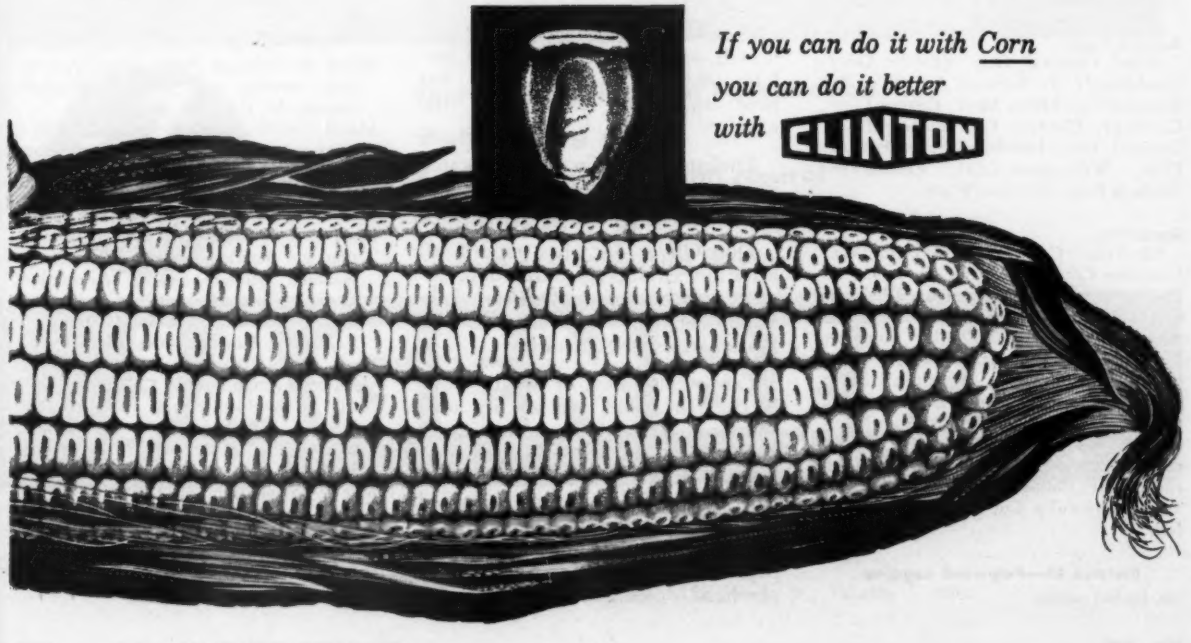

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you can do it better
with CLINTON

Safety . . .

of America (Container Div.), Chattanooga, Tenn.; St. Regis Paper Co. (Cleveland Corrugated Box Co.), Cleveland; St. Regis Container Co. (Superior Paper Products Co. Div.), Mt. Wolf, Pa.; Owens-Illinois Glass Co. (Box Plant), Los Angeles; St. Regis Container Co. (Dubuque Container Co. Div.), Dubuque, Iowa; Fibreboard Paper Products Corp. (Container plant), Antioch, Cal.; Mengel Co., Fulton, N. Y.; Container Corp. of America, Oakland, Cal.; Container Corp. of America, Baltimore.

Crown Zellerbach Corp. (Gaylord Container Corp. Div.), San Antonio, Texas; Container Corp. of America (Seattle Carton Div.), Seattle, Wash.; Wilson Paper Box Mfg. Co. Inc., Richmond, Va.; Container Corp. of America, Muskogee, Okla.; Dairypak Inc., Athens, Ga.; International Paper Co. (Bagpak Div.), Bastrop, La.; Container Corp. of America Container Div.), Cleveland; St. Regis Container Co. (Hunt-Crawford Div.), Coshocton, Ohio; American Can Co. (Marathon Div.), Sunnyside, Wash.

American Can Co. (Marathon Div.), Newman, Ga.; Dairypak Inc., Fort Worth, Texas; International Paper Co., (Single Service Div.), Waco, Texas; International Paper Co., Geneva, N. Y.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Tampa, Fla.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Carpentersville, Ill.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Seymour, Ind.; Weyerhaeuser Timber Co. Kieckhefer-Eddy Div.), Hastings, Neb.; Fibreboard Paper Products Corp. (San Joaquin Div.), Antioch, Cal.; Mengel Co., Lexington, Ky.; International Paper Co., Houston, Texas.

Insulation and Building Board

Johns-Manville Corp., Jarratt, Va.; Flintkote Co., Hilo, H. I.; Oregon Lumber Co., Dee, Ore.

Roofing Paper

Allied Chemical Corp. (Barrett Div.), Elizabeth, N. J.; Ruberoid Co., Erie, Pa.; Ruberoid Co., Millis, Mass.; Celotex Corp., Cleveland; Flintkote Co. (Pioneer Div.), Portland, Ore.; Fibreboard Paper Products Corp., Wilmington, Cal.; Certain-Teed Products Corp., Tacoma, Wash.

Specialties

Lily-Tulip Cup Corp., Augusta, Ga.; Container Corp. of America, St. Louis; St. Regis Paper Co., Kalamazoo; Kimberly-Clark Corp., Appleton, Wis.; Bay West Paper Co., Green Bay, Wis.; Container Corp. of America, Portland, Ore.; Kimberly-Clark Products Ltd., Winnipeg, Man.; Canadian St. Regis Paper Ltd., St. Jean, Que.; Container Corp. of America, Jeffersonville, Ind.; Lily-Tulip Cup Corp., Chicago; Kimberly-Clark Canada Ltd., St. Hyacinthe, Que.; Pollock Paper Corp., Houston, Texas; Lily-Tulip Cup Corp., Monticello, Ind.

Division III—Pulpwood Logging

No perfect scores.

Industry News

(Continued from page 761)

Kimberly-Clark Corp. announces plans to acquire the American Envelope Co. of West Carrollton, Ohio., a manufacturer of envelopes, fine stationery and other papers. If the merger is approved, American will be operated by its present management as a subsidiary of Kimberly-Clark.

Allied News Notes . . .

Hauser-Stander Celebrates 90th Year

The Hauser-Stander Tank Co. of Cincinnati is in its 90th year of building wood tanks for paper mills.

The company's specialty is the big heavy tank as used for blow pits or acid storage. However, they function equally well as a supplier of the smaller wood tanks and other specialized products such as stacks, pipe, stirrers and filter press plates.

Johns-Manville Corp. has completed acquisition of L. O. F. Glass Fibers Co. The newly-formed firm, Johns-Manville Fiber Glass Inc., will be a wholly-owned subsidiary of Johns-Manville Corp.

Huyck Felt Co. of Rensselaer, N. Y., has presented Western Michigan University with felt to clothe a new paper-making machine that is operated in the pilot plant of the paper school.

Dow Chemical Co. announces that it will open a sales office in Charlotte, N.C. T. H. Caldwell Jr. has been appointed manager of the office.

Lunkenheimer Co. has relocated its Boston branch sales office and warehouse to Medford, Mass.

Dorr-Oliver Inc. has moved all filtration engineering and development operations from Oakland, Cal., to the company's new international headquarters in Stanford.

Lawson Co., Div. of Miehle-Goss-Dexter Inc., has set up its own Western sales and service territories with offices in San Francisco, Los Angeles and Denver. The offices will be staffed by factory-trained men. The branches will offer the extensive line of hydraulic-clamp paper cutters, trimmers, and multiple head drilling machines.

E. D. Jones & Sons Co. will construct a new plant in Pittsfield, Mass.

B. L. Montague Co. Inc. has opened a new conveyor sales division at Greenville, S. C., with Curtis E. Green as director of conveyor sales and John W. Thompson as chief conveyor engineer.

Coming Events

Tappi

February 23-26—National Meeting, Hotel Commodore, New York.
March 9—New England Section, Greater Boston Area.
May 25-27—Tenth Coating Conference, Statler Hotel, Boston.

Superintendents Association

February 26—Miami Valley Division, Manchester Hotel, Middletown, Ohio.
March 19—Michigan Division, Imman's Restaurant, Galesburg, Mich.
March 24—Miami Valley Division, Moose Hall Lodge, Hamilton, Ohio.
April 11—Michigan Division, Hotel Harris, Kalamazoo, Mich.
April 16—Northwestern Division, Fenlon Hotel, Rhinelander, Wis.
April 23—Miami Valley Division, Manchester Hotel, Middletown, Ohio.
April 23—Northwestern Division, Rhinelander, Wis.
April 30-May 3—Pennsylvania, New Jersey, Delaware Div., Robert Treat Hotel, Newark, N. J.
May 14—Michigan Division, Hotel Harris, Kalamazoo, Mich.
May 21-23—Pacific Coast Div., Joint Meeting with Pacific Coast Section of TAPPI, Gearhart Hotel, Gearhart, Ore.
June 2-4—National Meeting, Shamrock-Hilton, Houston, Texas.

Other Meetings

March 8—National Paper Trade Association Meeting and Exhibit, Waldorf-Astoria, N. Y.
March 16-20—Fifteenth Annual NACE Conference and 1959 Corrosion Show, Sherman Hotel, Chicago.
March 23-26—Folding Paper Box Association of America, Drake Hotel, Chicago.
April 12-15—Thirty-Sixth Annual Convention and Merchandise Exhibition of the National Sanitary Supply Association, Conrad Hilton Hotel, Chicago.
April 13-15—AMA, National Packaging Exposition, Palmer House, Chicago.
April 13-17—Packaging Exposition, International Amphitheatre, Chicago.
April 21-28—Netherlands Packaging Exhibition, EUROPAK 1959, RAI Exhibition Halls, Amsterdam, The Netherlands.
May 7—Symposium on Corrosion Inhibitors, Contact Armour Research Foundation, 10 W. 35th St., Chicago.
May 25-27—Thirteenth Annual Convention of American Society of Quality Control, Cleveland Hotel, Cleveland.

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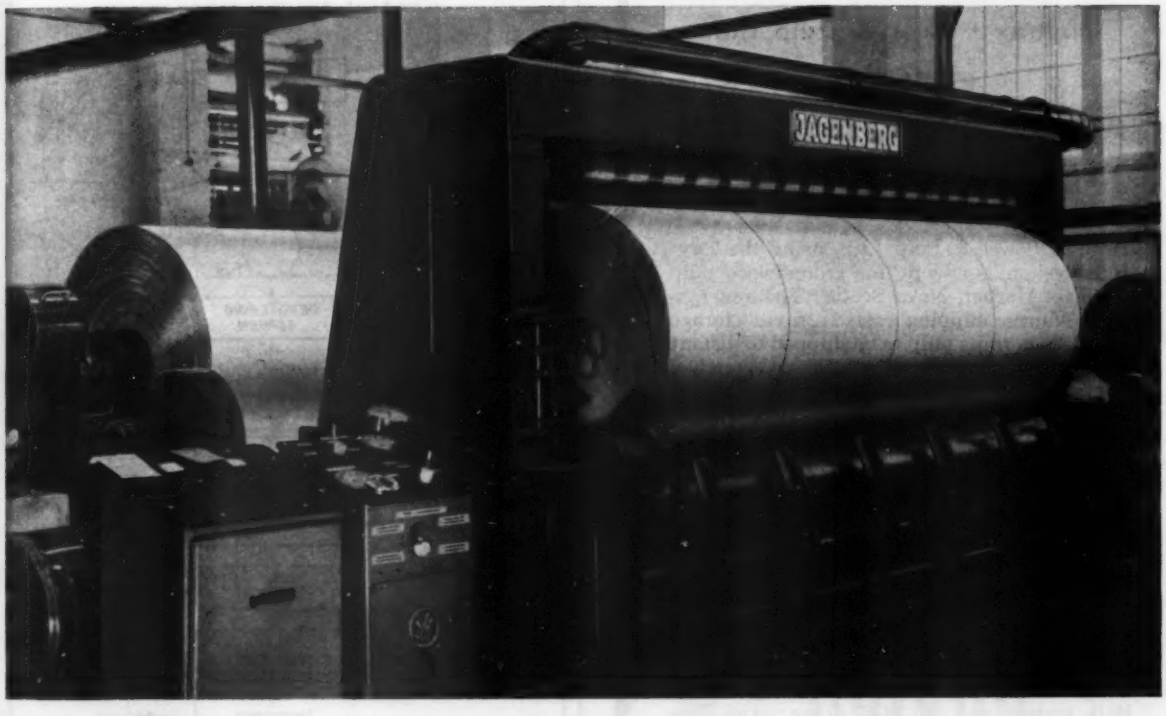

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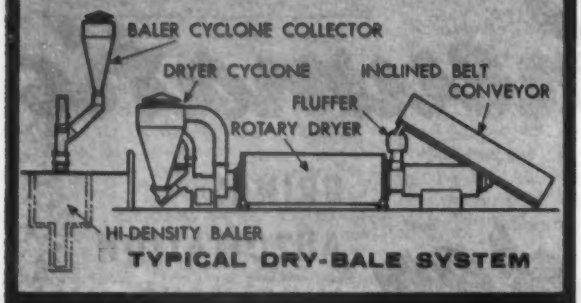

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dries groundwood pulp to 90% air-dry

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An integral part of the new system is the Heil dryer. A stream of hot air carries the fluffed pulp through the dryer . . . fine fibers are quickly dried and carried away, while wetter, heavier fibers move more slowly for longer exposure to the drying medium. Result: uniform drying of all fibers.

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For descriptive literature on the new Dry-Bale system and the Heil dryer, write The Heil Co. or Bauer Bros. Co., Dept. H, Springfield, Ohio.

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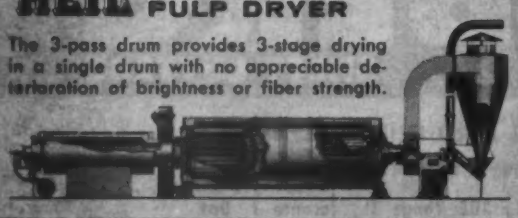

PATENT REVIEWS

MELVIN NORD*

Semichemical pulp process

U.S. 2,847,304, issued August 12, 1958, to Royal H. Rasch, Kenneth H. Fleming, Paul L. Leemhuis and Harvey Sutton and assigned to Hammermill Paper Co., describes a semichemical process for the production of pulp from wood chips that is suitable for use in the manufacture of high-grade writing and printing papers.

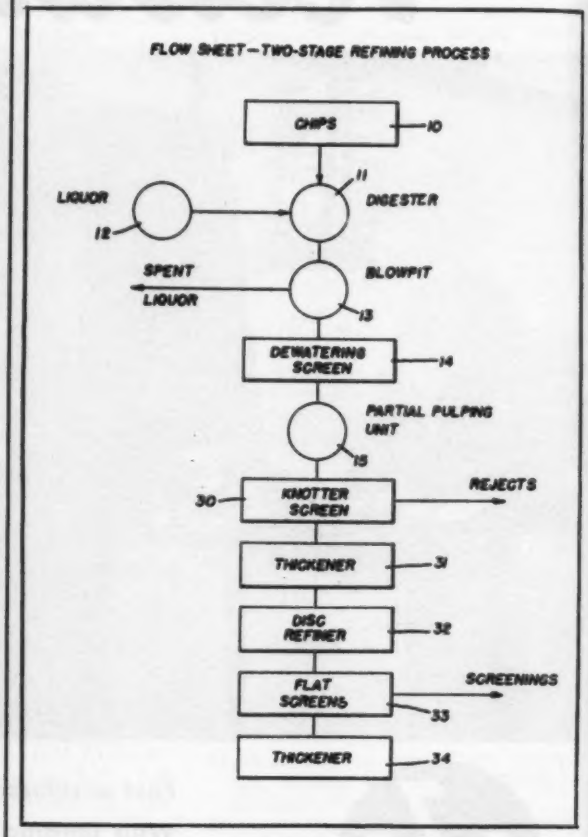

Fig. 1

As shown in Fig. 1, wood chips from a storage hopper 10 are fed into a digester 11 where they are immersed in a suitable softening or cooking liquor from a tank 12. Digester 11 serves to cook the wood chips in the liquor. The liquor employed and the details of the cooking process will vary with the type of wood used as a raw material and with the use to be made of the pulp.

At the conclusion of the cooking, the contents of digester 11 are blown under pressure into a blowpit 13—where the spent liquor is drained off and the material washed. The washed material is delivered from blowpit 13 to a dewatering screen 14 (this may be a relatively fine mash inclined screen of about 40 mesh), from which the material is fed into a partial pulping unit 15 adapted to impart a mild disintegrating action to the material.

The material or stock placed in unit 15 consists of softened wood chips that have up to this point largely maintained their original form and carry with them certain undesirable constitutents. These undesirable constitutents include large chunks of wood, over-sized chips, compression wood and knots that, because of size or density, have not been sufficiently softened in cooking.

*Patent attorney, 17600 Pinehurst, Detroit 21.

These materials, if restrained in the stock, will be objectionably apparent in the finished paper as dirt particles or as superficially-bleached fiber aggregates.

Pulping unit 15 is intended to provide a selective mechanical pulping of the stock that is sufficiently vigorous to reduce the softened chips to aggregates of fibers that will pass through the openings of a coarse screen or perforated plate. But this is not vigorous enough to materially reduce the size of the incompletely-softened constitutents. A suitable pulping unit is illustrated in Fig. 2. This consists of a cylindrical horizontal tank 16 having dished ends 17 and 18. A concave impeller 19 is mounted on a shaft 20 extending through end 17 and driven by an electric motor 21. A similar impeller 22 is mounted at the other end of tank 16 on a shaft 23 extending through end 18 and driven by an electirc motor 24. Motors 21 and 24 are arranged to drive impellers 19 and 22 in opposite directions in relation to each other. Units of this character are available on the market under the trade name Dynapulper.

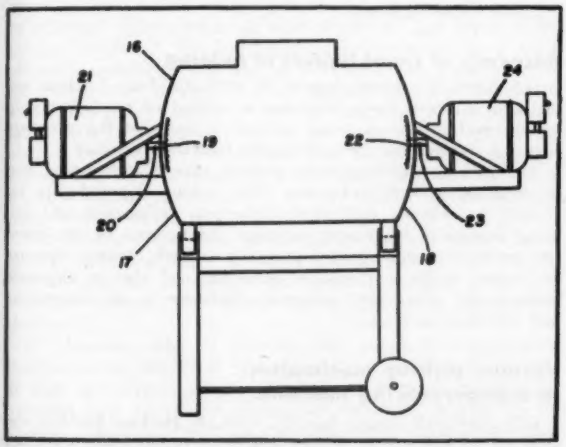

Fig. 2

Extremely hard particles of an abrasive material such as tungsten carbide are welded to the opposing faces of impellers 1 and 22. Rotation of the impellers in the stock sets up a centrifugal force that causes the stock to flow at a very high velocity across the surface of the impellers. The action is such as to reduce the softened chips to smaller fiber aggregates without cutting the fibers and without materially reducing the size of the harder undesirable constitutents of the stock.

At the completion of the pulping operation in pulping unit 15, the stock is fed to a suitable knotter screen 30. This screen serves to separate the fiber aggregates from the knots and other undesirable pieces of material in the stock. The size of the screen openings will depend upon the original size of wood chips, the degree of cooking, the extent of pulping and how selective a separation is desired. The undesired pieces rejected by the knotter screen, is supplied to a suitable thickener 31. The thickened stock is supplied to a refiner 32 that might be, for example, a disk refiner. Pulp from refiner 32 is supplied to a fine screen 33 that might, for example, be a conventional flat screen of the vibratory type. Screenings that are too large are removed from the pulp by screen 33. The remaining pulp that passes through the screen is thickened in a suitable thickener or decker 34. The output of thickener 34 is available for manufacture into the desired end product—which might be, for example, fine white paper. Normal bleaching procedures may be employed as a preliminary to delivery of the pulp to a papermaking machine.

Method of conveying wet pulp webs

U. S. 2,848,820, issued August 26, 1958, to Sven W. Wallin and Claes Allander and assigned to Aktiebolaget Svenska Flaktfabriken, describes a method of conveying wet pulp webs before entering a dryer.

A gaseous medium is discharged toward the underside of the web and is conducted away in the same direction as the motion of the web, thus forming a film or cushion of gas under pressure below the web.

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In order to prevent fluttering of the web, a gaseous medium is also discharged toward the upper side of the web and is conducted away in a direction perpendicular to the direction of travel of the web and parallel to the plane of the web.

The gaseous medium is suitably conditioned so that in addition to supporting and stabilizing the web in its travel it also effects drying of the web.

Flame-resistant fiberboard

U. S. 2,849,316, issued August 26, 1958, to Edgar A. Lauring and assigned to Minnesota & Ontario Paper Co., describes a method of rendering fire-resistant fiberboard.

Pulverized anhydrous borax is added to a pulp slurry just prior to formation of the board or mat. The formed board containing the chemical agent is subjected to drying (when it has 50 per cent or more water content) at 325-400°F for about 2 hrs. The anhydrous borax is thus changed in the board to a hydrated borax compound.

About 6-9 per cent of borax gives a satisfactory flame-resisting fiber insulating board.

Recovery of spent liquors in pulping

U.S. 2,849,292, issued August 26, 1958, to Philip E. Shick and assigned to Mead Corp., describes a method of producing pulp by chemical action on wood in such a way that the necessary chemical reagents may be substantially recovered for reuse.

The cooking liquor contains sodium salts of sulphurous acid in combination with carbonates. The cooking chemicals are recovered by utilizing controlled combustion, carbonation and sulfiting conditions to convert inorganic constitutents of the spent end products of the digestion operation to fresh cooking mixtures of sodium sulfite and sodium carbonate; and also to eliminate organic and undesirable inorganic substances in an inexpensive and unobnoxious manner.

Vacuum pick-up mechanism in a papermaking machine

U.S. 2,843,025, issued July 15, 1958, to Herbert Holden and assigned to Beloit Iron Works, relates to papermaking machines of the type in which the paper web is removed from the forming wire by means of a vacuum pick-up roll and a transfer felt.

Pick-up at the couch roll has the advantage in that the couch roll itself provides a firm backing for pressure to be applied to the web during transfer, the pick-up roll and the couch serving as a preliminary press section, with the vacuum applied primarily for the pick-up also serving to extract from the transfer felt water expressed into it from the web. However, the newly-formed web may have some variations in thickness or small lumps of fibers. Damage to the web in such an early stage of its formation may result from the localized pressure arising from the passage of these through a positive nip between the pick-up roll and the couch roll.

The present invention avoids this difficulty by adding a guide roll for the transfer felt in advance of the vacuum pick-up roll. The guide roll and the pick-up roll lie clear of the forming wire by an amount greater than the thickness of the felt. Thus, the web makes its first contact with the felt at a point between the guide roll and the pick-up roll and leaves the wire before the felt reaches the pick-up roll. Between these points the web is subjected to pressure exerted solely by an arc of felt conforming to the curvature of the couch roll, and the felt thus forms a flexible bite capable of passing lumps and variations in thickness without the same likelihood of damage to the web or wire that arises in passage through a positive nip.

Apparatus for removing test pieces from a traveling web of paper

U. S. 2,853,133, issued September 23, 1958, to Noel E. Norman and Richard W. Maddern and assigned to Australian Paper Manufacturers Ltd., describes a method and apparatus for removing sample or test pieces from a traveling web of paper or board in order to ascertain the moisture content of the traveling web.

The method involves causing a missile, having an endless cutting edge, to be projected through the traveling web at such speed that a sample piece of predetermined size and shape can be removed from any desired part of the web without liability of the

web being ruptured or torn. The method also proposes automatic capture of each sample or test piece and the sealing of it in such manner as to prevent any significant change in its condition pending examination.

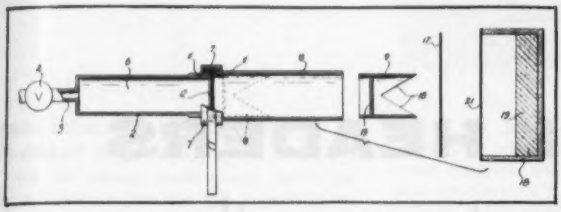

Fig. 3

As shown in Fig. 3, the device includes a tubular member 2 connected by a pipe 3, with a source of compressed air that may be admitted under control of valve 4 into the chamber 6 of the tubular member 2. The latter may be interconnected by a quick releasable coupling 7 with another tubular member 8 within which the missile 9 is normally housed and within which the missile has a sliding fit. Gaskets 11 may be interposed between the adjacent ends of the tubes 2 and 8 and a rupture disc 12 may be inserted between the two gaskets. Disc 12 may be composed of any suitable material (such as paper, plastic film or metal foil), that will rupture at the required pressure which may, for example, range from 30-60 lbs. p.s.i.

The missile 9 may take various forms but will usually be of hollow cylindrical shape having a closing wall 13 towards its rear and having its forward end provided with two or more V-shaped recesses. The endless cutting edge 16 is appropriately sharpened.

In operation, when a predetermined pressure is reached in chamber 6, the disc 12 is ruptured and the missile 9 is projected at high speed from the housing 8 so as to travel through the traveling web 17 at any position of its width selected by the operator. The missile with the removed sample or test piece, which will come to rest against or near the closing wall 13, may be brought to rest in a box 18 disposed behind the traveling web. This receptacle may be charged with straw 19 which will cushion the impact of the missile.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Apparatus for screening pulp	North Carolina Pulp Co.	2,845,848	8/5/58
Apparatus for producing bags	St. Regis Paper Co.	2,845,849	"
Carton carrier	Edlo Inc.	2,846,063	"
Collapsible bottle carriers	Diamond Match Co.	2,846,114	"
Carrier for bottles	Nicholas La Guardia	2,846,115	"
Tubular carton	Diamond-Gardner Corp.	2,846,131	"
Leak-proof carton	Container Corp. of America	2,846,132	"
Self-locking folding box	Edward R. Burden	2,846,133	"
Handle for paper bags	Esber Moubayed	2,846,134	"
Envelope for two-way use	Tension Envelope Corp.	2,846,135	"
Furfuryl alcohol polymer-protein-lingocellulose pulping liquor compositions	Crown Zellerbach Corp.	2,846,409	"
Production of a thermosetting plastic from sulfite pulp liquor	Permanente Cement Co.	2,846,431	"
Method of making bags	American Bag & Paper Co.	2,846,928	8/12/58
Method of erecting cartons	Ohio Boxboard Co.	2,846,929	"
Apparatus for making cartons	Package Machinery Co.	2,846,930	"
Cardboard container	Jagenberg-Werke A. G.	2,847,151	"
Shipping carton for wrap-around windshields	Lloyd D. Van Antwerpen	2,847,152	"
Dispenser box	Waldorf Paper Products Co.	2,847,153	"
Carton	William P. Frankenstein	2,847,154	"
Paper making machine drive	Beloit Iron Works	2,847,912	8/12/58
Bag bottoming machine	Equitable Paper Bag Co. Inc.	2,847,914	"
Production of envelopes	Raymond I. Rapp et al	2,847,915	"
Multi-cell bottle carriers	Diamond Match Co.	2,848,136	"
Paper container	Clarence H. Geiger Sr.	2,848,152-3	"
Cardboard carton and integral handle assembly	Roger H. Hanson	2,848,154	"

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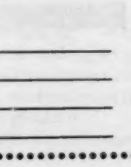

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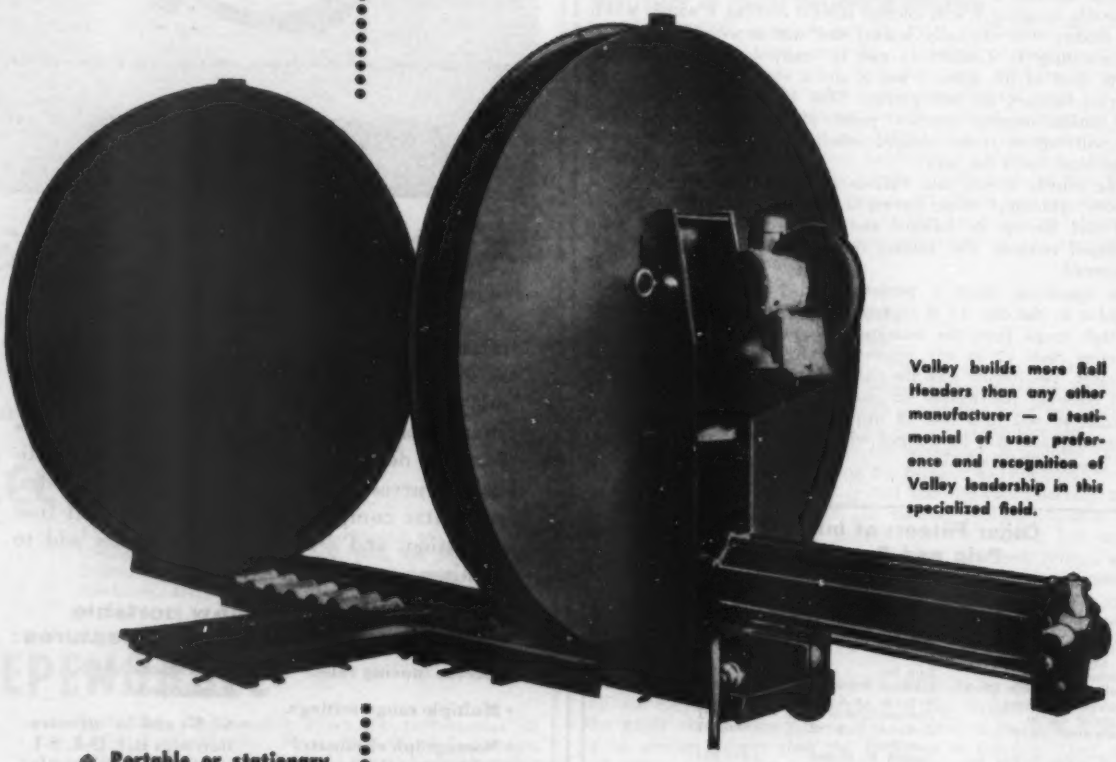

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FOREIGN ABSTRACTS

Determination of asbestos in paper products

The microscopic characteristics that serve to differentiate between the 2 main types of asbestos (serpentine and amphibole) are discussed, together with certain staining reactions. For the purpose of determining asbestos, samples were made up which contained bleached spruce sulfite pulp, unbleached spruce kraft pulp, linen halfstuff, wool and 5-50 per cent asbestos.

These mixtures were used in evaluating two analytical procedures, the one depending on combustion and the other on treating the mixtures with cuprammonium solution to dissolve out the organic material. When combustion was used, by heating 2 hrs. at 800 ± 25°C, certain corrections had to be applied because of the losses suffered by the asbestos samples themselves. Thus, for serpentine the ash had to be multiplied by 1.169 and in the case of amphibole—1.02. When the cuprammonium method was used, the resulting solutions did not exceed 0.5 per cent, and if wool was present, an additional treatment with hot 0.5 per cent sodium hydroxide was required. The higher accuracy was obtained with the cuprammonium procedure, which gave results with errors ranging from 0.1 - 1.5 per cent.

This method is recommended for research work. The simpler and less time consuming combustion method showed a range of error of 1-4 per cent. The latter is recommended for routine, control determinations. The analytical procedures are fully described.

Seven references, 15 figures and two tables are included. Jan Jaroszewski. *Prace Inst. Celuloz-Papier* **5**, No. 2, 23-30 (1956) (original in Polish with Russian and English summaries) through *Abstract Bull. Institute Paper Industry* **29**, 388 (1958).

Status and development prospects of the paper industry in China

In 1952, 600,000 tons of paper (40 per cent of which was handmade) were produced in the Chinese Peoples Republic. During that same year China imported 150,000 tons of board and paper and exported only 10,000 tons. With new developments which included modernization of existing mills and the construction of new plants, the combined paper and board production in 1957 rose to 1,230,000 tons. imports were reduced to 60,000 tons and exports reached 50,000 tons.

A large new mill pulps only reeds, and its annual production reached 70,000 tons of bleached pulp. The expressed hope is that by 1967 Chinese paper and board production will reach 3,700,000 tons; that China will have at least 13 integrated mills; that certain mills will produce specialty products, and that pulping, methods and machinery will be standardized.

Only about eight per cent of China is now forested. In 1967, the Chinese plan to utilize 39 per cent wood, 22 per cent reeds, 23 per cent straw, six per cent bamboo and about 10 per cent of other fibrous raw materials in papermaking.

Two research institutes have recently been established and is employing about 1000 people. There are three engineering schools having departments of paper technology with a total enrollment of 500 students. At technological institutes, and in certain special schools, about 4000 engineers are being trained.

S. P. Foteev. *Bumzb. Prom.* **33**, No. 1, 27-30 (January 1958) (original in Russian) through the *Abstract Bulletin, Inst. Paper Chemistry* **29**, 409 (1958).

Factors involved at the open draws at couch and presses

The balance of forces as paper is removed from the wire of a fourdrinier machine at the couch or from the press rolls has been considered in some detail.

This article comprises two main parts and four appendices. In the main text, the various forces involved are discussed and certain areas of practical papermaking are related to this discussion. It is shown that the force required to detach paper is made up of two terms which are additive. The first of these relates to the work of separation and to the angles of take-off. The second term deals with the force required to give the necessary momentum to the sheet. The first is independent of machine speed, whereas the second varies with the square of the speed and rapidly becomes dominant as this speed increases.

Approximate values for tensions in paper were calculated in the case of newsprint. In the following equation: $S = W/(1 - \sin \theta) + mV^2$, S = the tension in the web at any point; W = the work in separating the web from the couch at take off per unit area; θ = 90° minus the angle between the tangent to the web and tangent to the couch at the point of take-off; m = mass of the web per unit area and V = velocity of the web at any point. A list of the mathematical symbols used throughout the report is given.

Appendix I gives the derivation of the treatment used; II deals with the paper state while still on the couch, using an alternative approach, and III deals in detail with the treatment given by Meyer [*Wochbl. Papierfabr.* **82**, No. 11, 426 and No. 12,505 (1954)], and subjects this to critical examination and evaluation. Whereas Meyer's work is considered of interest, the authors feel that it cannot be used in practical papermaking. In appendix IV, as the result of mathematical analysis, it was shown that a curve could be found such that the paper tension is least, and that the further from this theoretical path that the paper runs, the greater will be the tension required in the sheet and the more difficult will be the machine operation.

Twenty-seven figures and 16 references (including two to unpublished work). J. Mardon, A. B. Truman, G. O'Blenes and K. Meadley. *Pulp and Paper Mag. Canada*, **59**, No. 9, 135-55 (1958).

Drying of paper on felt-covered cylinders

The study included a survey of the drying process in a multi-cylinder section of the paper machine. The temperature and humidity of the felt and the paper web were studied and the coefficient of transfer from the steam to the paper was determined. The speed of evaporation of water and its dependence on various distinct factors was investigated.

All of these experiments were carried out on an experimental paper machine at the Central Laboratory of the Swedish Paper Mills.

Av. L. Janson and B. Nordgren. *Svensk Papperstidn* **61**, 834-843 (1958) (in Swedish with English summary). Eleven figures, 10 references and five tables.

Clarification of liquors from kraft pulping operations

In kraft pulp mills, liquors obtained in washing unbleached pulps as well as those obtained in the alkaline extraction step in bleaching operations are turbid and highly colored and thus affect the total kraft mill effluent.

A clarification process was developed in which scrap aluminum or iron was used. This greatly reduced the color intensity and lowered the biological oxygen demand to about one third of its original value. Scrap metal is dissolved under constant aeration in the chlorine-carrying waste liquor of the bleaching process. This solution is then mixed with wash liquors from the pulping operation and waste liquors resulting from the alkaline treatment in the bleach plant. This thoroughly-incorporated mixture forms ferric or aluminum hydroxide which sorbs and thus removes organic matter and coloring matter, and the liquor is thus clarified. When scrap iron is used, the chlorine-containing waste liquor is rendered more acid with gaseous products, and the mixed waste liquors are treated with slaked lime to insure ferric hydroxide and colloid precipitation.

Six tables, one figure and six references

are included. R. Tanaka, T. Niwa, and E. Ubukata. *J. Japan. Tech. Assoc. Pulp and Paper Ind.* 12, No. 1, 28-32 (1958) (in Japanese with English summary); through *Abstract Bulletin Inst. Paper Chem.* 29, 416-17 (1958).

Delignification of wood and semichemical pulps with nitric acid

A study was made of the economical aspects of delignifying by means of nitric acid. Beechwood shavings in cooks carried out with three per cent nitric acid using a liquor to wood ratio of 10 to 1 gave rise to pulps of good quality. Nitric acid was recovered by passing the ensuing oxides of nitrogen formed during the cook into a solution of hydrogen peroxide. In the case of beechwood chips, a preliminary impregnation period at 40-50° C. was required, and in this case the liquor to wood ratio was 5 to 1. The acid actually consumed was about 14 per cent, and 45-80 per cent of the unused original acid was recovered.

Apparently, unless a more efficient recovery system is developed, nitric acid as a delignifying agent for wood is hardly economical. On the other hand, several types of high yield pulps were successfully delignified with 1.5-2.5 per cent nitric acid at a solid to liquor ration of 1-20; in such cases the yields were 42-55 per cent and very little chlorine was required in subsequent bleaching. The consumption of acid was about one half that needed for the delignification of beechwood, but recovery was more difficult. Evidently, satisfactory results were obtained by replacing chlorine by one per cent (or less) of nitric acid in bleaching kraft or sulfite pulps, and the consumption of the acid was relatively low — 2-3 per cent in the case of sulfite and 4-5 per cent in the case of kraft pulps.

So, in the bleaching of chemical and certain semichemical pulps, nitric acid has many advantages; delignification of the fibers is rapid and efficient, the spent liquor can be used over again (several times), and after neutralization lends itself to fermentation. The sodium hydroxide used in pulp extraction after such delignification can be recovered as sodium carbonate and the problem of stream pollution is thus obviated.

Pulps that had been bleached with nitric acid had high reactivity and showed good solubilities after xanthation.

Eleven tables, one figure and nine references. L. Kuniak and I. Slávik. *Papir a celulosa* 13, 6-11 (1958) (original in Slovakian) through *Abstract Bulletin Inst. Paper Chem.* 29, 572 (1958).

Sugars in technical side relief liquors

Although previous work has furnished data on the sugars present in spent liquors from spruce sulfite digestions, the content of individual monosaccharides in relief liquors has not been studied—especially when these were taken early in the cook.

The present study gives the total and individual sugar content in side relief liquors, and the results are compared with those obtained with normal sulfite spent liquor. Five different technical side relief liquors were analyzed chromatographically; the range of total monosaccharides was 0.72-3.18 gr. per liter. Although the variations were marked, arabinose usually predominated and the percentage of glucose was invariably very low.

In the table, averages for relief liquors are compared with those of spent liquors, and in the latter arabinose is very subordinate, whereas mannose is the dominant sugar. The results are discussed briefly.

Six references and two table are given. H. Sihtola, B. Anthoni and E. Rosqvist. *Paperi ja Puu* (Finland) 40, No. 10. 493-4 (1958) (in English).

	Arabinose %	Xylose %	Galactose %	Mannose %	Glucose %
Side relief liquor	34.4	25.5	9.2	26.5	4.4
Waste liquor	3—5	15—25	9—12	50—60	5—15

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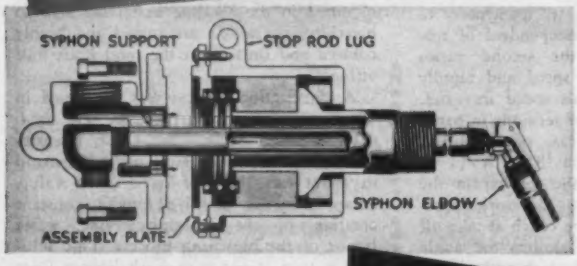

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Brightness and Opacity
of pulp and paper in terms of TAPPI specifications.
Also for Gloss and Color
tests on paper, card board, and other paper products.
Portable, reliable, rugged, simple to operate
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NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Silicone paper coatings

Silicone anti-adhesive paper coatings, called Syl-off, are now available.

Manufacturers, packagers, handlers and end-users are now discovering the thorough release they provide from kraft, glassine, parchment, multi-wall bag liners, boxboard, plastic film, etc.

Economical Syl-off coatings reveal excellent release and water-repellant characteristics. They are permanent and will not contaminate, migrate or alter stocks or packaged products. *Dow Corning Corp.*

Circle No. 11 on Readers' Service Card

Gear motor line

Announcement has been made of a new line of integral gear motors in both the concentric shaft and right angle types for integral horsepower motors through 100 hp. Also announced for the first time, is a line of fractional horsepower integral-type right angle gearmotors.

The new integral units are available with either open or totally- enclosed motors, double and triple reduction in standard ratios. *Allis Chalmers Mfg. Co.*

Circle No. 12 on Readers' Service Card

Centrifugal blowers

A new line of centrifugal blowers having a wide range of pressures and volumes has been made available. Sizes vary from 440 cfm at ¼-in. static pressure for a single-width, single-inlet fan to more than 460,000 cfm at 16-in. static pressure for a double-width, double-inlet fan.

Called Joy-Centrifoil Fans, these new blowers are said to be an improved design over the obsolete backward curved fans. The blades on these new blowers have an airfoil shape. *Joy Mfg. Co.*

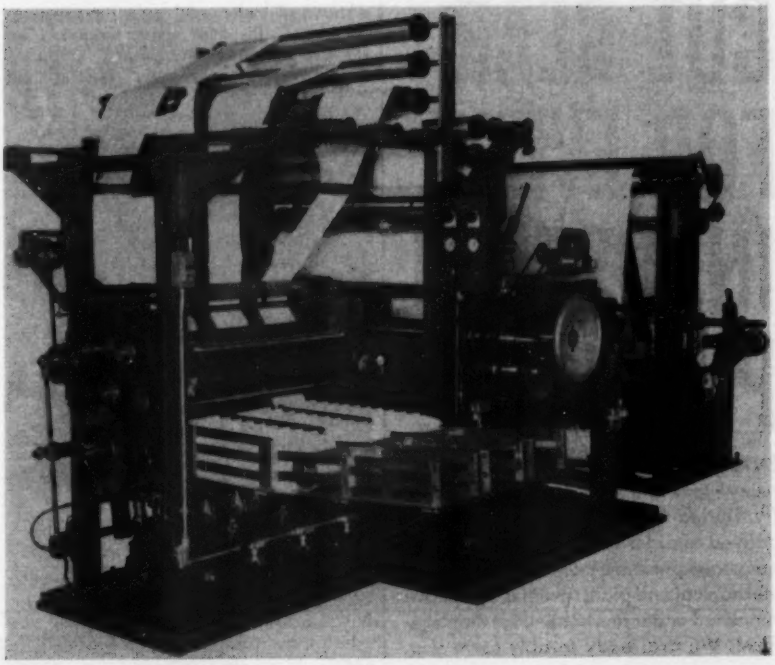
Circle No. 13 on Readers' Service Card

Automatic tension controller

A new production model of the P/A Automatic Tension Controller has recently been announced. The major improvement in the new model involves the re-packaging of the equipment with a more compact control panel in a heavy steel enclosure and cast-aluminum transmitter housing.

The new instrument-type enclosure used for the panel mounting shields control system components from the usual dusty mill atomsphere, yet permits immediate accessibility for servicing. *Pneumatic Applications Co.*

Circle No. 14 on Readers' Service Card



Triple napkin machine

Pictured above is the new triple napkin machine (Model No. 2522).

The machine is said to represent a completely new development in mass production of open-center facial napkins and will run the standard quarter-fold or the popular transverse eight-fold.

Operating speed of the new machine is 1000 napkins per minute of either 2-, 3-, or 4-ply facial quality stock. The jumbo roll is 52 in. in diameter and 45 in. in width. *Paper Converting Machine Co.*

Circle No. 15 on Readers' Service Card

Bearing lubricator

A new, low-cost automatic bearing lubricator that holds a reservoir of lubricant and automatically injects grease only as needed is now available. The position of the pressure cup on the unit signals at a glance the amount of grease remaining in the reservoir.

The automatic lubricator will operate in any position and can be mounted in cramped positions with standard adapter fittings. It is filled by any standard grease gun. *Anchor Chemical Co.*

Circle No. 16 on Readers' Service Card

Pipeline strainers

A new line of pipeline strainers made of Ductile (Nodular) iron is now being produced. These strainers are designed to withstand pressures of 600 psi at 650°F. They are available for standard pipe sizes from ⅜ to 2 in. *Strong Steam Specialties Div., Strong, Carlisle & Hammond.*

Circle No. 17 on Readers' Service Card

Plastic gate valves

A complete line of socket-weld Flex-Plug plastic gate valves has been an-

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SINCE 1888... We have been making many types and sizes of gears for industry. During these passing years we have derived considerable experience, trained numerous personnel, and expanded our mechanical and plant facilities—and have remained under one continuous management. We are ready to ably serve you.

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New Products . . .

nounced. Sizes are available from ½-2 in. in both PVC or styrene-copolymer.

This valve offers the combined features of straight through no-pressure-drop flow with close throttling control. With the addition of socket-weld ends, the valve can be used on the most severe services. *Vanton Pump & Equipment Corp.*

Circle No. 18 on Readers' Service Card

Hydraulic crane boom

Pictured above is the Gerlinger hydraulic crane boom that has been designed for bulky, heavy loads of odd shape and size which cannot conveniently be handled with forks.

The crane boom is hydraulically actuated. Line pull on hoist is hydraulically powered. It may be fitted to any Gerlinger fork lift truck and can be detached so truck may be operated with forks. *Towmotor Corp.*

Circle No. 19 on Readers' Service Card

Bench slitter

A new bench slitter capable of slitting extremely thin material into narrow widths is now on the market.

It is primarily intended for slitting small parent rolls—on short-run operation requiring a minimum of set-up time—into narrow widths.

The new machine slits as narrow as ⅛ in. with razor blades which can be set within .005-in. tolerance. The slitter also operates on ½ hp, three-speed motor which can be plugged into any 110-volt ac light socket. *Appleton Machine Co.*

Circle No. 20 on Readers' Service Card

Carton bottom stitcher

Staples with crowns up to 1⅜ in. wide are formed from rolled wire by the new Ideal wide-crown carton bottom stitcher.

This Ideal Model WS-IB-1240 is electrically driven and holds a 25-lb. coil of wire that will produce 12,500 staples without reloading. Optional equipment is available to accurately control the location of these wide-crown staples in cartons and fillers. *Ideal Stitcher Co. Div., W. R. Pabich Mfg. Co. Inc.*

Circle No. 21 on Readers' Service Card

Cold water carrier starch

Kobond, the first cold water swelling carrier starch designed specifically for use in the corrugating industry, is now available in commercial quantities.

Kobond represents an innovation in carrier starch formulation since it is pre-cooked under carefully-controlled conditions. In commercial use, no additional cooking is required. Kobond is simply added to cold water and mixed. In addition, Kobond is completely compatible with any raw starch used in corrugating formulation. *National Starch Products, Inc.*

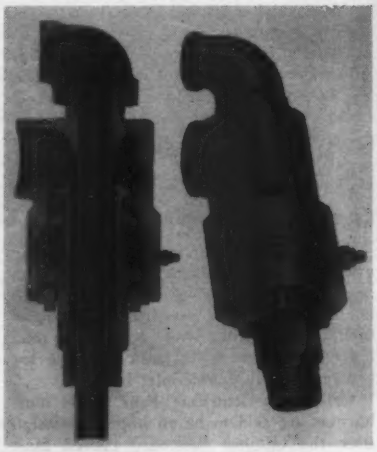
Circle No. 22 on Readers' Service Card

Speed changer

Introduction of the Vari-Tex speed changer line in horizontal and vertical units for smooth, instant speed variations has been announced by Allis-Chalmers.

The company claims the new speed changer's four-position motor mounting and two-position gear mounting makes it possible to readily adapt the unit to varying space conditions. Its one-piece motor and driver sheave shaft supported between bearings at the ends reduces shaft deflection and increases efficiency. *Allis-Chalmers Mfg. Co.*

Circle No. 23 on Readers' Service Card



Rotary Union

A revolving, low-friction sealing connection between a stationary supply pipe and revolving machine cylinder, roll or drum, is now on the market. Called the Rotary Union, it has mechanical seal and ball bearing construction for decreasing wear and power consumption.

Rotary Unions come with either dual pipe connections (Type S) or single pipe connections (Type P) for siphoning work

on installations requiring both the supply and the return of gases within the same unit, or for siphon drainage of condensate from steam chamber or drum.

The Rotary Union handles steam, water, air, vacuum, industrial fluids or gases on applications up to 250 psi, 150 psi for steam, and temperatures to 500°F without requiring adjustments.

Pipe sizes of Rotary Unions range from ¼ to 3 in. with right or left hand threads. *Perfecting Service Co.*

Circle No. 24 on Readers' Service Card

Temperature transmitter

This transmitter is of particular interest to anyone with low-cost temperature measurement requirements in the −30°F to +1200°F. range

The Sensaire transmitter is a compact unit unaffected by normal plant vibration. It is said to incorporate the smallest bulb presently available in a filled system.

A universal-type mounting bracket permits installation almost anywhere. *Taylor Instrument Companies*

Circle No. 25 on Readers' Service Card

Solenoid control valve

A solenoid control valve that is a pilot-operated diaphragm actuated globe or angle valve is now on the market. It operates automatically on pressure from the line or independent supply, pneumatic or hydraulic, and it may be installed vertically or horizontally.

The valve is offered in 1- to 3-in. screwed and 1- to 4-in. flanged. Pressure rating is 160 psi ac or 100 psi dc. *CLA-VAL Co.*

Circle No. 26 on Readers' Service Card

Stainless steel pipe fittings

A new line of Schedule 5 and 10 roll-grooved stainless steel pipe fittings has just been introduced for installation with Victaulic couplings.

Stainless steel elbows, tees, crosses, returns, stub and blank ends, reducers and reducing tees with roll-grooved ends are available from stock in sizes that range from 1¼ - 4 in. in diameter. Additional sizes of fittings can be promptly produced on order. *Victaulic Co. of America.*

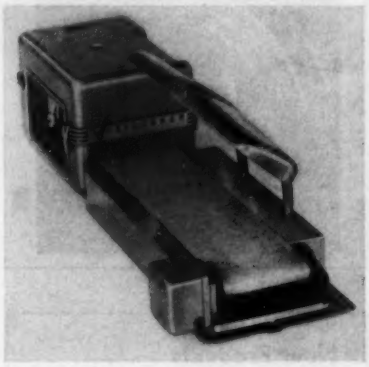
Circle No. 27 on Readers' Service Card

V-belt drives

A completely new line of V-belt drives, featuring smaller and lighter sheaves and V-belts of higher capacity at substantially lower cost, is announced.

Introduced under the trade name Dyna-V, the new line of drives covers the complete range of horsepower capacities available in conventional drives. Savings in space, weight and cost are made possible by scientific advances in developing stronger metals for sheaves, and synthetic rubbers and fibers for belts. *Dodge Mfg. Corp.*

Circle No. 28 on Readers' Service Card



Oscillographs

Two new direct-recording oscillographs that provide higher recording frequencies and increased channel capacities have been developed.

They monitor and record a variety of electrical and mechanical phenomena during high-speed scientific and industrial testing operations.

The 906A-1 features highly-sensitive subminiature plug-in galvanometers and magnetic assembly. Use of subminiature galvanometers permits 14 channels of data

Carthage-Norman Chippers Give You Greater Yield of Higher Strength Pulp

With its unique helicoidal disc segments and variable-bevel knives, the Carthage-Norman Chipper produces the highest percentage of "to size" chips. There are fewer compressed or bruised chips and ½% to 1% less sawdust — a feature which can pay for the chipper in one year. Knives wear longer — cost less. Heavy-duty construction results in exceptionally low maintenance costs.

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Please send full details showing why a Carthage-Norman Chipper will give me a greater production of uniform, clean-cut, "to size" chips.

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STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA

New Products . . .

to be directly recorded at frequencies of DC to 5,000 cps.

The 906A-2, with "solid frame" galvanometers and magnetic bank, provides for eight channels which record at DC to 2000 cps. frequencies.

At the same time, two new accessories—a timing unit and a record latensifier—have been introduced to assist in the operations of the new oscillographs. *Heiland Div., Minneapolis-Honeywell Regulator Co.*
Circle No. 29 on Readers' Service Card

Heat exchangers

An exclusive retainer ring designed to speed up and simplify inspection and service is a distinctive feature of the Paracoil Type PC heat exchangers now on the market.

These exchangers are designed to handle either oil, water, air or gas. Straight tube construction permits easy cleaning, and the use of a double-packed floating tube sheet eliminates expansion and contraction stresses. *Davis Engineering Corp.*
Circle No. 30 on Readers' Service Card

Debarking and chipping pine trimmings

A noteworthy progress has been made in the development of a small, yet effective, debarker for pine thinnings.

This debarker employs the cambium chear principle of bark removal. The debarking tools are pulled rather than pushed against the stick as it passes through the machine. *American Pulpwood Association.*
Circle No. 31 on Readers' Service Card

Air Vibrator

The new Navco BH-3-SP Hi-Impact vibrator for electrostatic precipitators and dust collectors has been announced.

This vibrator is a heavy-duty unit with a one-piece construction design. It can be arranged with a timer and solenoid valve for complete automatic control. The unit weighs 52 lbs., measures 11 in. long, 5 in. wide and 10½ in. high. *National Air Vibrator Co.*
Circle No. 32 on Readers' Service Card

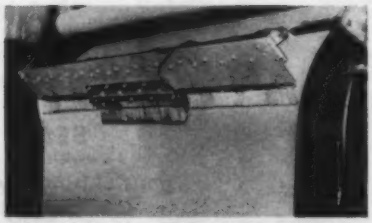
Motor pumps

Ingersoll-Rand's new K line of motor pumps are offered in sizes of 1/3 through 25 hp, for heads to 190 ft. and capacities to 775 gpm. They are said to be compact, sturdy and are ideal for food processing plants, general manufacturing plants and buildings. *Ingersoll-Rand*
Circle No. 33 on Readers' Service Card

Cyclone dust collector

A new, high-efficiency cyclone separator, operating in the 2000-3000 cfm range, has been introduced.

Designated as Model No. 24, the new cyclone is specially produced to handle large volumes of bulky dust. Its new self-cleaning radial fan design is said to give high performance at low horsepower requirements. *Torit Mfg. Co.*
Circle No. 34 on Readers' Service Card



Detection brushes

Detection brushes that "read" the surface of paper, plastic, etc. are now in production. Called Metlekor feeler brushes, they send low voltage pulses to an indicating system which records the condition of the material under construction when used with proper electronics equipment.

To illustrate how a brush works, the product (paper or other electrically non-conducting material) is passed between it and a metal roll, plate or bar. The equipment is then grounded and whenever a hole or flaw appears, the brushes contact the grounded roll transmitting a low-voltage pulse to a remotely located indicator unit. Then the exact location of holes is indicated and recorded. *M. W. Jenkins' Sons Inc.*
Circle No. 35 on Readers' Service Card

Resurfacing floors for skid resistance

A scientifically-formulated powder and a special liquid binder have been developed for resurfacing floors, stairs, ramps, metal cat-walks and stair treads.

Called Stoncap, the product has extreme slip-resistant qualities which are safety-designed by the manufacturer to stop floor accidents.

Stoncap may be applied on wet surfaces and is available in five colors: maroon, gun metal, forest green, light green and light grey. *Stonhard Co. Inc.*
Circle No. 36 on Readers' Service Card

Synthetic rubber O-rings

A new du Pont synthetic rubber to be used in making O-rings for OPW-Jordan swing joints is now available. Called Viton-A, it is reportedly unequaled for service with steam, oils, fuels and solvents.

It is adaptable for steam pressures of up to 125 psi and temperatures to 400°F. Viton-A gives long wear and trouble-free operation under adverse conditions. Swing joints are used where piping flexibility is required.

O-rings are available for 1¼-, 1½-, 2-, 2½-, 3-and 4-in. swing joints. *OPW-Jordan Industrial Sales Div., OPW Corp.*
Circle No. 37 on Readers' Service Card

Flexographic press

A new small-size flexographic press is now in production.

Known as model 2637, it prints two colors against a single impression cylinder at speeds of 500-600 fpm. It has a repeat range of 8- 16-in. This press also has run-

PHOTO BY EWING GALLOWAY, N. Y.

HAM FELTZ says:

"Reminds me how HAMILTON Felts run water"

YOU CAN'T BEAT

Hamilton

FELTS

Hamilton Felts run water like a sieve. They're "water-conditioned" for fast water removal so they deliver drier sheets to the drier, permit operators to run machines at higher speeds with fewer stops, less broke.

If this is the performance you'd like felts to give contact us—today!

SHULER & BENNINGHOFEN, HAMILTON, OHIO

New Products . . .

ning circumferential and side register controls, and progressive adjustments can be made on it.

Model 2637's anti-friction construction assures it free-running whether used separately or in line with other equipment. *Paper Converting Machine Co.*

Circle No. 38 on Readers' Service Card

Reels

A new reel, known as the Rola Reel, has been announced. Its unique quadrant reel carriage substitutes a rolling motion for sliding motion, thereby providing a new accuracy for control of nip pressures, and it offers a flexible design for a wide range of roll diameters.

The finished reel is automatically discharged onto the back of the reel stand, which permits the carriage to be returned immediately to receive the newly-started paper stool. The finished roll may be rolled onto a skid or carriage without using a crane. *Sandy Hill Iron & Brass Works.*

Circle No. 39 on Readers' Service Card

Adjustable speed drive

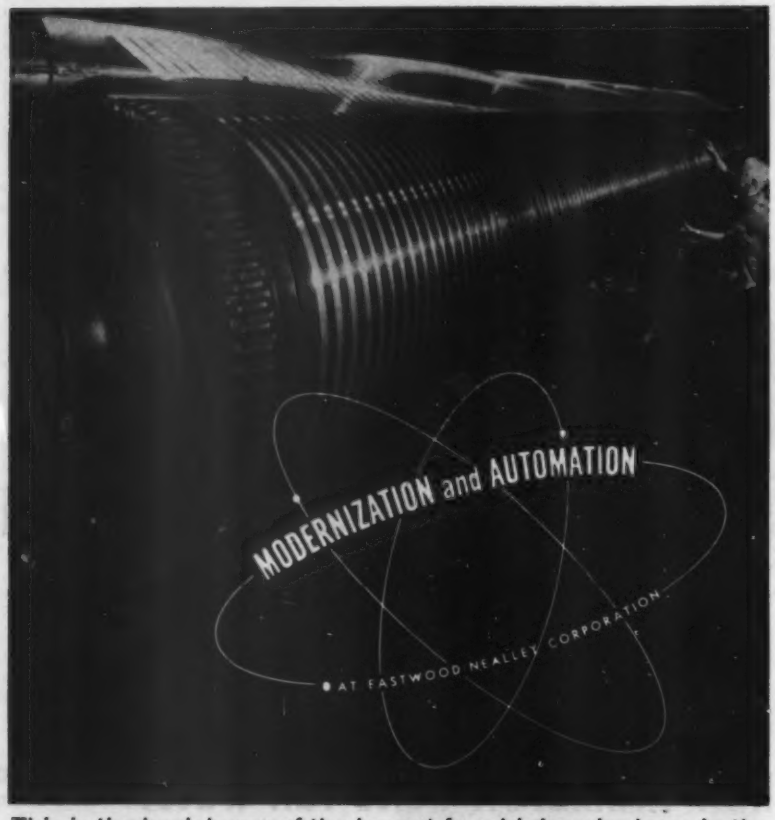
Adjusto-Spede is the trade name given to a new adjustable speed drive. Its ratings are from ¾-7½ hp with a stationary field construction. The redesigned construction in these ratings also reduces the length of the drive up to 22 per cent.

All brushes, commutators and slip-rings have been eliminated, which substantially reduces the maintenance.

The drive is designed to supply precise operating speeds for machine process machinery, windups, conveyors, printing presses and similar equipment. It is suitable for continuous operation at full load (constant torque) in ranges as high as 34:1 and for intermittent use from O to full speed, or any rpm in between.

It can also be operated by automatic controls such as temperature, pressure and level detecting devices. *Louis Allis Co.*

Circle No. 40 on Readers' Service Card



This is the back beam of the largest fourdrinier wire loom in the world. Before it begins to weave, weeks must be spent "dressing" it with the wire that will be woven into the cloth that makes paper. Twenty thousand pounds, or 90 MILLION feet of warp wire must be wound carefully on this huge cylinder. Great machines such as these are custom built by Eastwood-Nealley, and their performance is guarded every instant by electronic controls. **This is part of our modernization and automation program designed to benefit the manufacturer of paper.**

EASTWOOD-NEALLEY CORP.
BELLEVILLE NEW JERSEY

Temperature control valves

From 2000-50,000 lbs of steam per hour capacity or 2300 gall. of water per minute can now be handled with the OPW-Jordan 4- and 6-in. temperature control valve now available from stock. Thermal systems are available in copper, stainless steel, carbon steel and monel. *OPW-Jordan.*

Circle No. 41 on Readers' Service Card

Electric level-trol

Engineers have designed and perfected an electric level-trol, type 2300. Using the conventional pneumatic level-trol cage and displacer float as the measuring element, it delivers a proportional 1-5 milliampere dc signal through a 3000 ohm load.

Explosion-proof design and external adjustments for proportional band and liquid level height render this type for suitable use in hazardous locations. *Fisher Governor Co.*

Circle No. 42 on Readers' Service Card

Aluminum pipe

New "low-cost" aluminum piping is now available since the perfection of its manufacturing processes. A wide industrial market for it is anticipated.

Called Unistrength pipe, it is a seamless, one-piece pipe which combines thin walls with standard wall thickness at pipe ends.

Unistrength pipe, produced in 40-ft. lengths, is currently available in 6063-T6 and 6061-T6 alloys with a schedule 40 wall thickness at the ends. This permits the use of standard aluminum fittings and flanges. Additional combinations of wall thicknesses can be produced for other joining methods. *Aluminum Co. of America.*

Circle No. 43 on Readers' Service Card

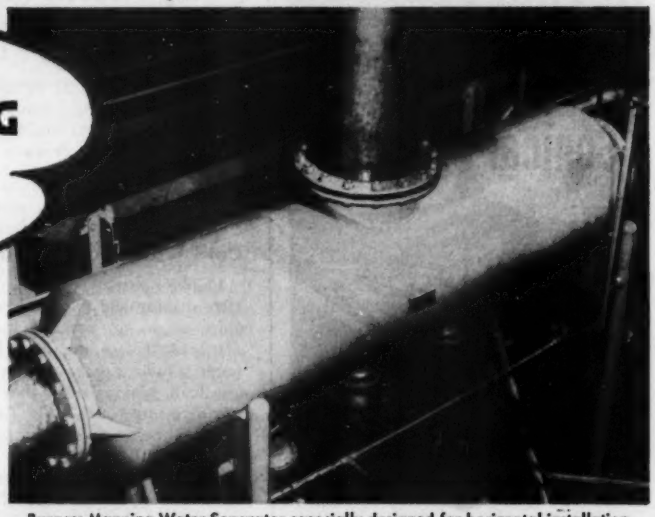
Solid film lubricant

An effective solid film lubricant, which greatly increases the wearability of moving parts operating in oil or grease, has been developed.

Features of this improved solid film lubricant include: small particles of lead,

If Water Separation is *Your* Problem—

SEE HOW BURGESS-MANNING handles it for Crown Zellerbach!



Burgess-Manning Water Separator especially designed for horizontal installation and use with Mold-Yankee machine at Crown Zellerbach California plant.

The separation of entrained water from a stream of air or gas is a familiar problem to Burgess-Manning engineers. They have been called upon to perform this task many times since the first Burgess-Manning Water Separator Snubber was introduced.

The Water Separator installed in the Crown Zellerbach plant at Antioch, California by the Beloit Iron Works is typical. Because of the unusual requirements of this installation a special water separator was designed and built.

A horizontal installation, between the Mold-Yankee paper machine and a centrifugal exhauster, was required, with a 14" inlet at each end and a center 18" outlet. The capacity is 6500 CFM, and entrained water from the water seal is entirely removed.

In many Burgess-Manning Water Separation installations, unlike this one, exhaust silencing is also an important function.

If water separation or exhaust silencing is a problem, consult Burgess-Manning!

BURGESS-MANNING COMPANY
Sound Engineering
Industrial Silencer Division
9235 Sovereign Row, Dallas 35, Texas
Libertyville, Illinois

New Products . . .

tin and graphite, that are well known for their ability as bearing materials; its semi-porous nature absorbs oil and acts as a reservoir against metal to metal contact under high loads and especially during long shut-down periods.

By preventing metal to metal contact, galling and seizing is also prevented.

This solid film lubricant can be applied to spherical bearings, clutch assemblies, leather oil seals, spline assemblies, bearing cages, sleeve bearings, piston cylinders, valve stems and hydraulic actuator parts. *Electrofilm Inc.*

Circle No. 44 on Readers' Service Card

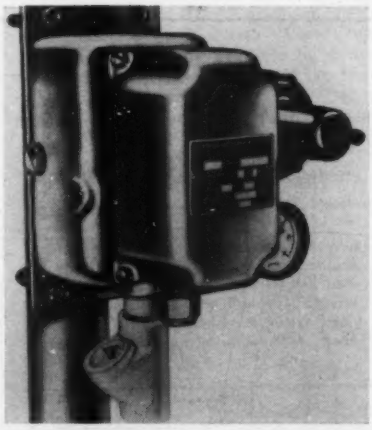
Paper waxing machines

A new cooling principle has been incorporated in a new paper waxing machine. This principle eliminates many time-consuming operations required for making waxed bags with conventional machinery.

Known as Model 77 NB, the machine will take a web up to 23 in. wide, and will wax up to a 24-in. web width. Wider widths are also available.

It is equipped to apply a cool wet wax surface to two sides of a sheet of paper. This results in a wax coat which is less liable to mar or scuff than that applied by conventional machinery. *Potdevin Machine Co.*

Circle No. 45 on Readers' Service Card



Electro-pneumatic transducer

An electro-pneumatic transducer is being produced to operate a standard pneumatic control valve in an electrical control loop.

This transducer utilizes a high-capacity relay to produce a pneumatic output pressure that is proportional to do a milliampere input signal. This allows the use of fast electrical transmission in conjunction with dependable and inexpensive pneumatic valve actuators. *Fisher Governor Co.*

Circle No. 46 on Readers' Service Card

Cantilever jib cranes

New wall bracket, full cantilever-type jib cranes are now available. These cranes have been designed for maximum hoist travel where a minimum amount of overhead room is available, without detracting from their efficiency.

They can be mounted on existing building columns or can be furnished with supporting structures.

These jib cranes are available with capacities of up to three tons and spans of up to 20-ft. They are designed for 180° rotation. *All-State Engineering Co. Inc.*

Circle No. 47 on Readers' Service Card

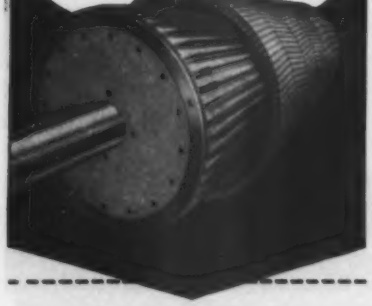
New industrial fire hose

Announcement has been made of a new fire hose that can be soaked continuously in mud holes, strung out in the dankest part of an underground mine for months at a time, or hung in an atmosphere heavy with acid fumes—all without hurting the hose. The product is so tough that a truck can run over it without causing a burst.

The single jacket hose is designed to withstand surge pressures far beyond its initial 500-lbs. psi pressure test. It has ex-

IDEAL COMBINATION FOR ANY

Conical Refiner



Jones Adapta-Plug

The completely bandless plug for *all* Jordans, the Jones Adapta-Plug is also the strongest, most adaptable, most economical plug ever made.

This revolutionary advance, exclusive with Jones, not only holds bars more securely, reduces slot wear and corrosion, but also cuts hours from the job of stripping and filling.

Before you replace another Jordan plug — ask your Jones representative about Adapta-Plug — or write us direct.

Jones FULBAR SHELL FILLINGS

Fulbar Shell Fillings eliminate keys and wedges. One piece construction fits shell body of any Jordan, simplifies handling, cuts installation time. And the patented No-wave pattern — also exclusive with Jones — has no sharp bar-ends to form strings or lumps.

For improved quality, more economical, trouble-free operation — make your next Jordan filling a FULBAR.

Rigid, one-piece FULBAR easily accommodates to inequalities in shell body of old, worn Jordans — is simpler to install, easier to grind in.

E. D. JONES CORPORATION
Pittsfield, Mass.
In Canada: The Alexander Fleck, Ltd., Ottawa

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

New Products . . .

ceptional resistance to abrasion as well as being impervious to mildew, oil, acids, alcohols, hydrocarbons and detergents. *B. F. Goodrich Industrial Products Co.*
Circle No. 48 on Readers' Service Card

Cold-water soluble caseins

Unlike most conventional caseins—which after soaking and the addition of alkali, require up to 60 min. of heating at from 130° - 180°F. — the new Protovac cold-water soluble caseins require only 10 min. of alkali soaking and about 30 min. of mixing at only 60° - 80°F. The rate of solution can be increased by use of a high-speed mixer.

The four new caseins were designed for use in paper coating, inks, adhesives, textile finishing and thickeners. They are being shipped in 100-lb. paper bags, which may be stored safely for more than a year. *Borden Chemical Co.*
Circle No. 49 on Readers' Service Card

Spray dryer

A newly-patented spray dryer, (called Tower-Anhydro) that includes many new design features for producing high-grade finished products is out on the market.

The new spray dryer is no longer handicapped with such problems as hot spots and charring within the drying chamber, because all piping and hot surfaces on which the finished product can accumulate has been eliminated.

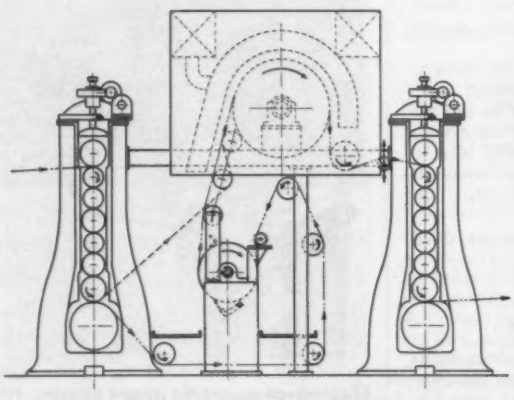
The new dryer is available in both laboratory and production models and with three types of heating systems for air drying—depending on the processing temperatures required. *Tower Iron Works Inc.*
Circle No. 50 on Readers' Service Card

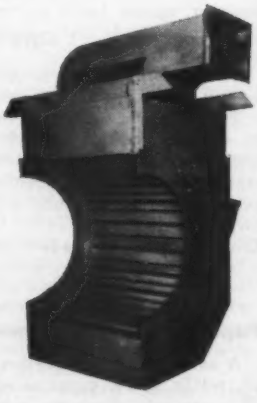
Tandem blow-off valves

A new tandem blow-off valve for boiler blow-off pressure of up to 665 psi and with basic rated pressure of up to 400 psi has been developed.

The sealing valve has the familiar Yarway seatless design. Its parts are interchangeable with the existing type B seatless blow-off valves. The seatless valves positively close with the tight seal.

These new medium pressure tandem blow-off valves come with flanged or welding ends, and with right or left hand assembly. *Yarnall-Waring Co.*
Circle No. 51 on Readers' Service Card





High-velocity dryer

A new dryer has been developed for use with Black-Clawson Co.'s Flexiblade and other type coaters.

It is called the 3-D dryer, which stands for high velocity, high temperature and high volume. This new high-velocity dryer features a highly-efficient method of introducing and removing hot air evenly across the web.

The 3-D dryer is furnished for paper machine application for either steam or gas heating. *Black-Clawson Co.*
Circle No. 52 on Readers' Service Card

NEW LITERATURE

Books

GUM PLASTICS. By M. S. Thompson. Published by Reinhold Publishing Corp., Dept. B-196, 430 Park Ave., New York 22, N.Y. Pages: 189. Price: $4.50.

In this text the author emphasizes the applications of impact-polystyrene, ABS polymers and impact PVC. The general properties, chemistry and fabrication of these compounds are also covered.

Thompson describes the advantage of these compounds in terms of product improvement and shows how certain disadvantages of these materials can be overcome. Special attention has been given to new applications, new compounds and a discussion of applications now in the development stage.

This book provides product designers, engineers and fabricators in those industries that use or could use plastics with the first basic reference on gum plastics.

BIBLIOGRAPHY OF PAPERMAKING AND U. S. PATENTS 1957. Compiled by Jack Weiner. Published by TAPPI, 155 East 44th St., New York City. Pages: 636.

This edition contains literature on pulp and paper manufacturing published in 1957 and pertinent U. S. patients for the pulp and paper industry issued during the above year. Patents issued earlier and overlooked at the time of issue are also included.

No attempt has been made to completely cover various topics of interest to plant engineers. Articles on machinery, lubrication, power, safety, etc. have been, in general, included, if they appeared in magazines devoted to the pulp and paper industry.

Patents included in the second part of the bibliography have been selected from the *Official Gazette* of the U. S. Patent Office. The patent section of the *Bulletin (Library Notes) of The Institute of Paper Chemistry* and of *Chemical Abstracts* have also been checked. The patents have been arranged according to the system used by the U. S. Patent Office. Thus, all patents in a related field are compiled together.

No claim is made for the completeness of the compilation, because the actual content of many patents is not clear, even from their abstracts.

Booklets

1959 DIRECTORY OF OCCUPATIONAL SAFETY POSTERS is the title of a booklet published by the National Safety Council. These 756 miniatured posters are the culmination of NSC's 45 years of experience in publishing posters for creating constructive work attitudes on the part of workers in various industries and related occupations. Choices of various subjects were made in proportion to the number of hazards experienced by industry. Psychological standards were applied in selecting these varied appeals to workers. Copies of this directory may be obtained by writing to NSC Membership Service, 425 N. Michigan Ave., Chicago 11. Prices: 1-9 copies, $.60 each; 10 copies, $.45 each, and 100 copies, $.35 each. Members receive 10 per cent discount on these prices.

USDA Reports

TECHNICAL NOTES. Here is a list of three Technical Notes that are now available. No. 540—"1957 Forest Tree Seed Crop about Average in the Lake States"; No. 541—"Site Index Curves for Paper Birch in Northern Wisconsin", and No. 542—"Timing DDT Sprays in the Spring for European Pine Shoot Moth Control". Copies are available by writing to M. B. Dickerman, director, Lake States Forest Experiment Station, U. S. Department of Agriculture, St. Paul 1, Minn.
and Wood.

STATION PAPERS available from the Lake States Forest Station. Station Paper No. 65 gives the Silvical Characteristics of Balsam Poplar; Station Paper No. 66 gives the Silvical Characteristics of Black Maple and Station Paper No. 67 gives the Silvical Characteristics of Northern White-Cedar. All three studies are available by writing to M. B. Dickerman, director, Lake States Forest Experiment Station, U. S. Department of Agriculture, St. Paul 1, Minn.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Graphite pipe

Falls Industries Inc.'s new bulletin describes a new modular concept for corrosion-proof impervious graphite pipe and fittings.

Circle No. 53 on Readers' Service Card

Clarifiers and Oxidators

Process Engineering Inc. Div. of Eimco Corp. has issued a 24-page brochure covering its line of Clarifier and Oxidator mechanisms for water, sewage and industrial waste treatment. It describes all basic units that cover a full range of tank sizes and load requirements, and special units for unusual conditions. Related and auxiliary equipment, such as sludge thickeners, the Clarifier-Digester, a combined sewage treatment plant, skimming devices and Non-Clog Diffusers, are also described.

Circle No. 54 on Readers' Service Card

Mixers and mixing

Infilco Inc. has published a new bulletin on mixers and mixing, where it discusses the theory of mixing and compares operational ranges of different mixing equipment. The bulletin also has tables to assist the engineer in selecting various sizes of mixers for any special application, depending on the degree of mixing required. It is clearly divided into slow and rapid mixing, blending and flocculating and gas dispersing mechanical equipment.

Circle No. 55 on Readers' Service Card

Wrinkle-removing technique

Mount Hope Machinery Co.'s bulletin, Application of Mount Hope Rolls to the Size Press, shows paper makers, using the company's rolls, how to remove wet wrinkles after sizing operations.

Circle No. 56 on Readers' Service Card

Conveyor tables

Lamb-Grays Harbor Co., Inc. has published a four-page color folder on Airfloat tables, a patented conveyor system for paper mills, paper-handling plants, printing houses, etc. The conveyor is designed to float the load on a film of air without causing slippage or disarrangement of vertical alignment.

Circle No. 57 on Readers' Service Card

Colloidal silica

National Aluminate Corp., through its new Nalco bulletin K5, describes the physical and chemical properties of its Nalcoag colloidal silicate product, offered as an aqueous suspension of 15, 30, or 35 per cent silica. This eight-page, illustrated bulletin also describes the product's present and potential uses.

Circle No. 58 on Readers' Service Card

Chemicals catalog

Antara Chemicals, a sales div. of General Aniline & Film Corp., offers an expanded and revised 64-page chemicals catalog. It is divided into separate sections devoted to surfactants, organic intermediates, carbonyl iron powders and numerous specialty chemicals.

Circle No. 59 on Readers' Service Card

Stainless steel valves

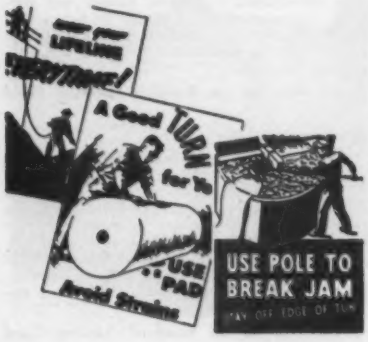
Jenkins Bros. has issued a new catalog describing its complete line of stainless steel gate, globe and swing check valves with full details about valve patterns in alloys that satisfy the requirements of most corrosive services. A 10-page section, which shows at a glance the degree of resistance of the company's alloys to many corrosive media under varying conditions, is also included in the catalog.

Circle No. 60 on Readers' Service Card

Foamsil

Pittsburgh Corning Corp. announces the availability of a new folder containing background information on the unique new foamed silica material that is 99 per cent pure fused silica and has a practical operating range of

POSTERS
— A POTENT SAFETY TOOL



Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in two sizes: "A" size, 8½"x 11½", and "B" size, 17x23". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.
Chicago 11, Illinois

450°F to 2200°F. The material is unaffected by practically all commonly-used acids and is unaffected by thermal shock.

Circle No. 61 on Readers' Service Card

Unit-tandem blow-off valves

Yarnall-Waring Co., with its bulletin, fully describes the new Yarway medium-pressure, unit-tandem blow-off valves for boiler blow-off pressures of up to 665 psi and 400 psi basic pressure rating.

Circle No. 62 on Readers' Service Card

Fluid power equipment

Oilgear Co. has prepared a bulletin giving specifications, illustrations and other descriptive matter on the complete line of fluid power equipment.

Circle No. 63 on Readers' Service Card

Pumps and blowers

Sutorbilt Corp. is offering a bulletin showing how its California series of rotary positive pressure blowers and gas pumps are used to solve several air and gas handling problems. This eight-page bulletin includes 17 photos, a dimensioned drawing and a full-page chart that outlines performance samples for 20 different blowers and gas pumps.

Circle No. 64 on Readers' Service Card

Inhibitor papers

Orchard Paper Co. is offering a new comprehensive, easy-to-read manual, written in non-technical form, describing its line of inhibitor papers. These papers are used to combat rust, corrosion and tarnishing that costs American industry over $7½ billion per year. It contains many samples of Orchard's inhibitor paper, use and application charts and case histories. The manual is bound to allow additional inserts when the company developes new kinds of inhibitor papers.

Circle No. 65 on Readers' Service Card

Envelope press

Southworth Machine Co.'s four-page brochure announces the company's new envelope printing press, with full details on its operational features and physical nomenclature.

Circle No. 66 on Readers' Service Card

Mechanical seals

Syntron Co.'s new catalog on mechanical shaft seals and custom-built roll neck seals is now available. These seals are designed to stop gas and liquid leakage around the rotating shafts of pumps, compressors, mixers, etc, and eliminate adjusting, repacking and other maintenance.

Circle No. 67 on Readers' Service Card

Saw tooth crusher

Sprout, Waldron & Co. Inc. is offering a specification sheet giving construction, design and application data on a heavy-duty precision-built saw tooth crusher. Referred to as Model 250 AA, the crusher was specifically designed for the reduction of warm plastic stock, but it is said to be suitable for heavy-duty crushing of tough and brittle materials.

Circle No. 68 on Readers' Service Card

Vibrating screen separators

Southwestern Engineering Co. describes the Sweco vibrating screen separators in two bulletins. The 20-page S-581 bulletin, with its many photos, drawings and diagrams, explains how the separators operate, their screening patterns, advantages and their industrial application. Photos of 22 separators featured by the company are shown. The bulletin also includes a partial index of screened materials. The S-572 bulletin features the company's engineering service for those interested in Sweco separators and a news section, with photos, showing how different companies apply Sweco vibrating screen separators.

Circle No. 69 on Reader's Service Card

The Paper Industry
Professional and Business Services

J. E. SIRRINE COMPANY
ENGINEERS
GREENVILLE, SOUTH CAROLINA

Design — Consultations
Paper & Pulp — Reports
Water & Waste — Appraisals
Steam & Hydro Power — Steam Utilization

MILL COGS

We make a specialty of "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "O" and instruction sheets free.

The N. P. BOWSHER Co., South Bend, Ind.

PROJECT ENGINEER

Our expanding Engineering Department has an outstanding opportunity for an experienced man. The opening requires a man who has a degree in Mechanical Engineering or equivalent. He must have 3 to 5 years paper mill experience or 7 to 8 years experience in the manufacture of paper mill machinery. He must be a man who can step in and assume responsibility for process studies, design and development work.

Salary open. Excellent Benefit Program plus successful Profit Sharing Plan available. Your inquiry, with detailed resume and salary requirements, will receive immediate and confidential attention. Write

Mr. John A. Burton,
Personnel Manager
C. H. Dexter & Sons, Inc.
Windsor Locks, Connecticut

Eight Publications for Papermakers

Pulp and Paper, Volume I	$18.00
Pulp and Paper, Volume II	18.00
Paper and Paperboard Making	6.00
Technology of Paper Coating	2.00
Lessons in Papermaking—Part 1	1.50
Lessons in Papermaking—Part 2	1.50
Notes and Observations on Beaters	1.00
Trouble on the Paper Machine	.75

Mail your order with payment to:

The PAPER INDUSTRY
431 S. Dearborn Street, Chicago 5, Illinois

WANTED — COMPTROLLER AND ASSISTANT TREASURER

for pulp and paper company which will build a 500-ton per day average kraft pulp and linerboard mill to be located on the Tennessee River with excellent opportunity for future growth and expansion. Among qualifications required are: thorough knowledge of accounting and its application to industry and timberland operation; age between 35 and 50; should have experience from Southern kraft pulp and paper industry; imagination and initiative; to act in over-all advisory capacity to local officer in charge of complete operations. Position has excellent opportunities of growth in future. Only well-qualified applicants will be considered. Applications will be considered confidential.

TENNESSEE RIVER PULP & PAPER COMPANY
230 Park Avenue, New York 17, New York

NEW SLIMICIDE

(tributyl tin oxide complex)

Agents wanted to handle this new slime killer priced at $2.40 per lb. Every mill who have tried this unique material are now regular users. Paper mill personnel may act as agents in spare time. Inquiries will be held confidential. Write Box 672, The Paper Industry.

CLEANING EQUIPMENT

—for plant maintenance and tank cleaning, hot "jet-stream" cleaning with Sellers Hydraulic Jets. Send for Bulletin 424-B, Sellers Injector Corp., 1603-J Hamilton Street, Philadelphia 30, Pa.

BOARD MILL CHEMIST — Married, with family. Available immediately. Experienced in mill operations, furnishes, refining, color matching, coatings, printing, new product development and quality control. Write Box 673, The Paper Industry.

In view of future development on the common market, a prominent European paper corporation, producing a wide range of fine grades, wants to contact American companies willing to grant license or patent rights for manufacture of specialties. Address replies to Box 674, The Paper Industry.

ROGERS

KNIFE GRINDERS

HEAVY DUTY SERIES

220

Pictured is standard 210" Model 220 equipped with 15 HP Motor and 20" Segmental Grinding Wheel.

Rogers Heavy Duty Model 220 Grinder furnished in sizes from 78" to 240" with mechanical or hydraulic drive. Grinding Heads from 10 HP to 40 HP with segmental grinding wheels from 16" to 30" diam. Rogers Grinders have guaranteed built-in accuracy to produce the best grinding results. Many models and sizes from which to choose. Write for complete information.

SINCE 1887

SAMUEL C. ROGERS & CO., INC.

2070 SHERIDAN DRIVE • BUFFALO 23, NEW YORK

X MARKS THE CRITICAL SPOTS!

It takes more than muscles to build a storage bin

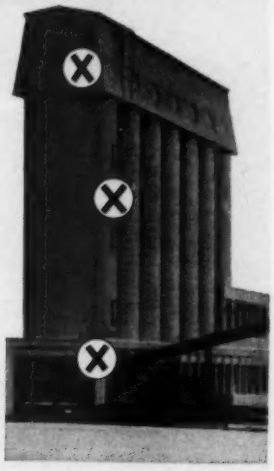
Before the physical work of building a bin begins, we must know the problems involved at the *Three Critical Points.*

X What is the loading problem?

X What are the characteristics of the material to be stored . . . and its "flowability"?

X What is the volume and rate of discharge?

When planning your next storage bin, may we sit in on the very early stages of planning?



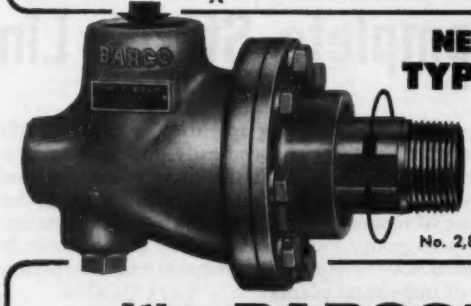
N & F

NEFF & FRY COMPANY

170 Elm St., Camden, Ohio

You can always spot a Neff & Fry Bin by the shape of the stave!

Need a *Better* rotary joint?



NEW TYPE C

Patent No. 2,836,439

-it's BARCO!

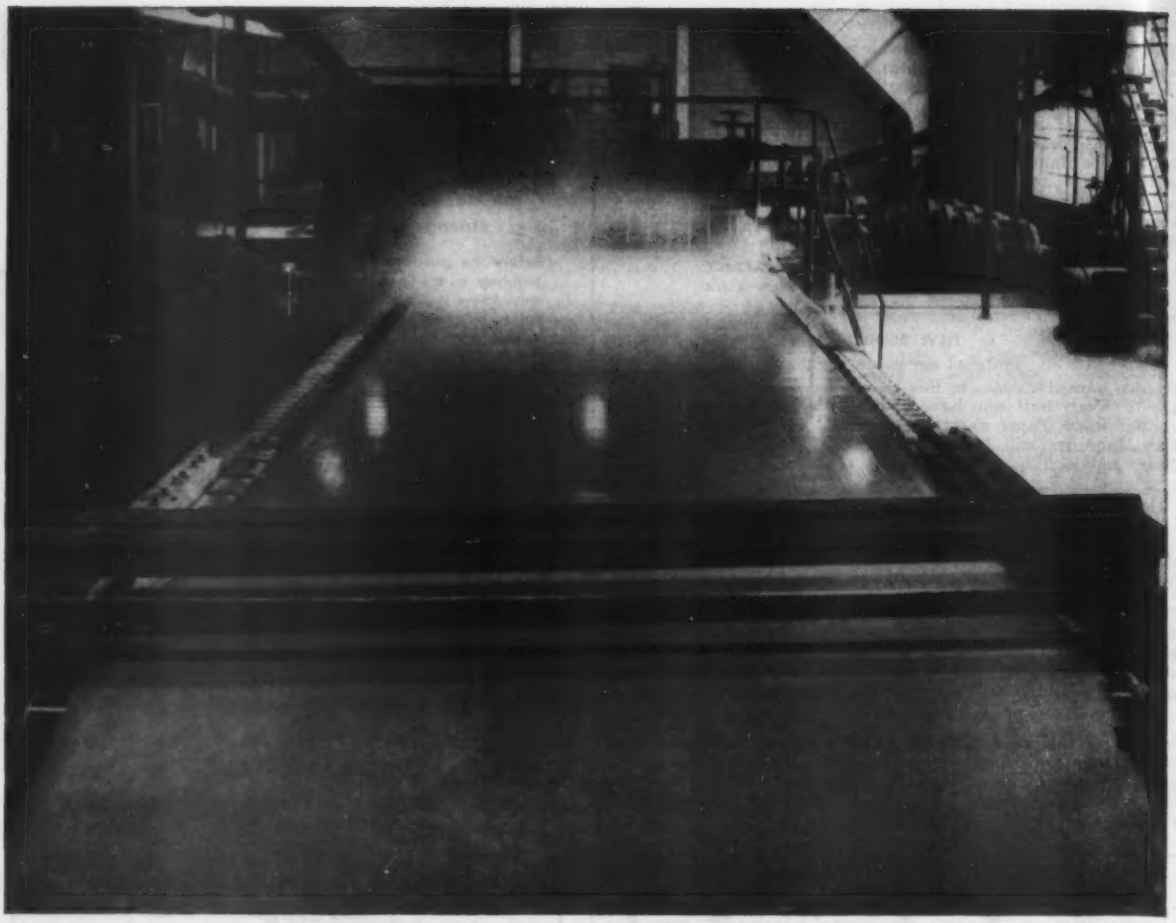
For countless applications, Barco's new Type C Rotary Joint will give you the best operating records you've ever had—*and for LESS COST!*

"CRACK-FREE" CHROME PLATED SLEEVE—A standard Barco feature. Minimizes corrosion, friction, wear. Stainless steel spring also standard.

RESISTS SEAL RING BREAKAGE—The spherical seal ring is under compression, not *tension*, loading. Self-adjusting for wear. Seal withstands shock loads and alternating hot and cold service.

WIDE SPACED BEARINGS—Two, instead of one . . . increased bearing area. No lubrication required. Lowest friction.

200 P. S. I. STEAM RATING—Heavy duty service at *no extra cost.* Eight sizes, ½" to 3". *Send for new Catalog 310 today.* **BARCO MANUFACTURING CO.,** 526C **Hough Street, Barrington, Illinois.**



A Complete Starch Line... *tailor-made to your needs*

Today's complex papermaking operations require a wide range of starches—starches specifically designed to do a particular job. You'll find that the complete starch line offered by Corn Products Company includes types for every phase of modern papermaking. These starches are available in so many varieties that *they can literally be tailor-made to suit individual requirements* and production problems of individual plants!

For example, in beater sizing, preferred starches for improved surface qualities plus excellent bursting and tensile strength, include the many varieties of Globe and pre-cooked Amijel. For calendar sizing, you'll find a complete line of Claro and Eagle starches, as well as Globe starches for enzyme conversion. In this operation, Globe and Excello dextrines and thin-boiling Foxhead starches are also used. For general coating, with good viscosity at high solids content, use Claro and new improved Ten-O-Film starches.

And the research staff of Corn Products Company, largest in the industry, is constantly at work developing new products to meet the changing needs of modern papermaking.

Our technical representatives are completely versed in the problems that arise with wet end additives. Their impressive field experience and continuing research into starch, evidenced by frequent publications in trade and technical journals*, is always at your service. Take full advantage of the facilities and experience of the world's largest corn processors—call our nearest sales office or write direct.

Fine products for the Paper Industry: GLOBE® • EAGLE® • FOXHEAD® • CLARO® • AMIJEL® CORAGUM® • TEN-O-FILM® starches • GLOBE® • EXCELLO® • LAM-O-DEX® dextrines and gums.

CORN PRODUCTS SALES COMPANY 17 BATTERY PLACE, NEW YORK 4, N.Y.

*A reprint on the results of corn starch usage is available on request from our New York office.

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.70— .75
No. 2 roofing (Chicago)	.50— .55
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Bark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	90.00— 95.00
No. 1 hard white shavings	80.00— 85.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	50.00— 55.00
Fly leaf shavings No. 1	25.00— 27.50
Fly leaf, woody, No. 1	23.00— 25.00
Mixed colored shavings	21.00— 23.00
No. 1 books and magazines	17.00— 18.00
Ledger stock, white, No. 1	50.00— 52.50
Ledger stock colored, No. 1 (Midwest ship)	30.00—
New manila envelope cuttings (free of groundwood)	60.00— 65.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	75.00— 80.00
Colored tab cards	50.00— 55.00
New northern kraft envelope cuttings	60.00— 65.00
Triple sorted kraft, 100%	30.00— 35.00
No. 1 old kraft	30.00—
White news cuts, No. 1	55.00— 60.00
No. 1 overissue news	—
Folded news, special	18.00— 19.00
Folded news, ordinary	16.00— 17.00
Old corrugated boxes	22.00— 23.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	11.00— 13.00
Boxboard cuttings	7.00— 9.00
No. 1 mixed paper	7.00— 9.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	145.00—
L. c. l., ton	155.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 98%, drums c. l., delivered lb.	.29½—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb	.14¾—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	9.75—
N	8.40— 8.60
WG	9.85—
WW	10.40—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	8.20—
N	8.40—
WG	8.75—
WW	9.20—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	24.00—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb.	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅛—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—167.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100 00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	64.70
75% "	49.65
50% "	37.80
25% "	31.90
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	65.85
75% "	50.80
50% "	39.00
25% "	33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartens):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.50
60-lb.	8.75
50-lb.	9.00
40-lb.	9.25
35-lb.	9.75
30-lb.	10.50
25-lb.	11.25
20-lb.	12.25
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.00
(Sheets — Plus 50c cwt)	

Names in the News

(Continued from page 765)

tomers of the construction, remodelling and maintenance services offered by the company.

Martin Davis has been appointed manager of sales of d-i Lestoil to paper mills by the Industrial Sales Div. of Lestoil Inc., Holyoke, Mass. Davis will be available for consultation with paper manufacturers.

Lester B. Gordon has retired as vice president of Solvay Process Div., Allied Chemical Corp. Gordon began selling Solvay products in 1915 and was vice president since 1951. His duties will be carried on by **Arthur Phillips Jr.**

Sofus Miller has joined the Plant Projects Div. of Bauer Bros. Co. Miller has had extensive experience in the sulphite pulping industry in both Canada and United States. He was formerly with Homad Services Ltd., Montreal, and G. D. Jenssen Co. Inc., Massena, N. Y. The company has also announced the addition of **Crockett Carl Hendricks** to its Southern sales division. He was formerly with Albany Felt Co. and has wide experience in the pulp and paper industry.

Appleton Machine Co., Appleton Wis., announces the promotion of three executives. They are **Victor W. Bloomer,** chairman of the board; **Tany Agronin,** president, and **John M. MacDonald Jr.,** vice president.

Warren K. Brown has been elected vice president in charge of engineering Chemical Linings Inc., Watertown, N. Y. He has been connected with Chemical Linings since 1952 and has been chief engineer of the company and its subsidiaries for the past two years. It was also announced that **W. James Heuer** has been elected vice president in charge of West Coast operations. This office is located in Seattle, Wash.

Earl R. Zuelke, engineer of the Shartle Div., Black-Clawson Co. has been awarded first prize in the 1958 design contest of the Gray Iron Founders' Society Inc. He submitted a case history description of how the foundry of the Shartle Div. redesigned the inlet head and dirt collection box of its Liquid Cyclone to effect a cost saving through substitution of Grey Iron castings for the former fabricated steel construction.

John C. Intermaier has been appointed manager of the physical research section of the felt development department for Huyck Felt Co. **Hans H. Dirzuweit** was appointed manager of the paper making felt development section.

Warren Pumps Inc., of Warren, Mass., has appointed **Allan Edwards Inc.** of Tulsa, Okla., as their industrial sales representative for Oklahoma, Kansas and parts of Nebraska, Iowa, Texas, Missouri and Arkansas.

Necrology . . .

John W. Odlin

John W. Odlin, former newspaperman and internationally-known specialist in technical advertising died in January.

Odlin began his career in newspaper work with the Boston Post as a sports writer. In 1913 he became secretary to the late Mayor Wright.

In 1922, Odlin organized the John W. Odlin Co. Inc., Worcester, Mass., advertising consultants. He has been president-treasurer since its organization. For his clients, which were large industrial concerns, he mapped campaigns for newspapers and trade papers all over the world.

Many technical articles on advertising for national trade magazines and also articles and booklets on outdoor life has been written by John Odlin. A keen interest in politics also lead him to become "ghost" writer for many speeches given by Republican candidates for local, state and national offices, and also directing campaigns for them.

Bartholomew Sproule

Bartholomew Sproule, a pioneer Canadian paper box manufacturer, died in December.

Sproule founded the firm of Collett, Sproule Ltd., Scarborough, Ontario, more than 50 years ago with the late E. B. Collett. Prior to this, he was in the paper box business earlier with his own firm.

In 1940, Sproule became president of Collett, Sproule Ltd. until it changed hands in 1947. From then on he was vice president and a director of the present, Collett-Sproule Boxes Ltd. He was a past president of the Canadian Paper Box Manufacturers Association.

John Hoerres, vice president and secretary of Whiting-Plover Paper Co., Stevens Point, Wis., died in December. Hoerres joined Whiting-Plover in 1948.

Gaylord L. Beason, executive vice president of Fort Orange Paper Co., Castleton-on-Hudson, N. Y. died in December. Beason has been with Sutherland Paper Co. (of which Fort Orange is a subsidiary) for 25 years. He was transferred to Fort Orange three years ago.

ENGLISH CLAYS AMERICAN

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation

6 East 45th Street, New York 17, N.Y.

Index to Advertisers

Acme Steel Company
Adell Chemical Company 722
Albany Felt Company 726-727
American Cast Iron Pipe Co.
American Cyanamid Co. 720-721
American Paper & Pulp Co., Inc. 769
Anheuser-Busch, Inc.
Antara Chemicals
Appleton Wire Works, Inc.
Appleton Wood Products Co.
Arnold, Hoffman & Co., Inc.
Arrow Tank Co., Inc.
Asten-Hill Mfg. Co. ..... 2nd Cover
Atkins Saw Division
Barco Manufacturing Co. 787
Bauer Bros. Co., The
Beloit Iron Works
Bird Machine Company 748
Black-Clawson Company, The 723
Bolton & Sons Inc., John W.
Bowsher Co., The N. P. 786
Buell Engineering Company 761
Burgess-Manning Company 783
Cameron Machine Co. 715
Carthage Machine Co. 779
Castex Paper Export Co., Inc.
CIBA Company Inc. 758
Classified Advertising 786, 787
Clinton Corn Processing Co. 767
Corn Products Sales Co. 788
Darling & Company ..... 3rd Cover
Dempster Brothers
De Zurik Corporation 772
Dow Chemical Co.
Draper Brothers Company
Eastwood-Nealley Corporation 782
Egan & Co., Frank W.
Electric Eye Equipment Co.
English China Clays Sales Corp. 790
EPIC, Inc.
Fairbanks, Morse & Co. 757
Fitchburg Screen Plate Co., Inc.
Foote Bros. Gear & Machine Corp. 759
Fritz Publications, Inc. 786
General Chemical Division, Allied Chemical Corp. ..... 4th Cover
General Dyestuff Company
Georgia Kaolin Company 728
Hanchett Manufacturing Co. 791
Hart-Moisture-Meters
Heil Company, The 770
Horton Manufacturing Co., Inc. 780
Hubinger Company, The
Humphrey Elevator Company
Huyck Felt Co. 745
Improved Machinery, Inc. 746
Ingersoll-Rand
James Gear Mfg. Co., D. O. 778
Jenkins Sons, Inc., M. W. 764
Johnson Corporation, The 776
Jones & Sons Company, E. D. 784
Kalamazoo Tank & Silo Co. 760
Kerrigan Iron Works, Inc.
Ladish Co.
Lawson Company, The 755
Layne & Bowler, Inc.
Lestoil, Inc. 722
Lindsay Wire Weaving Co., The
Link-Belt Company 729
Lockport Felt Company
Lodding Engineering Corp.
Marathon Southern Corporation
Moisture Register Co. 773
Murray Mfg. Co., D. J.
Nash Engineering Co., The 751
National Safety Council 786
Naylor Pipe Company
Neff & Fry Company 787
Northwest Engineering Company 762
Norton Company
Oilgear Company, The 750
Paper Industry, The 786
Parsons & Whittemore/Lyddon Organization
Patton Manufacturing Co., Inc., The 1st Cover
Penick & Ford, Ltd., Inc. 733
Perkins & Son, Inc., B. F.
Phillips Company, Inc.
Photovolt Corporation 776
Planet Corporation 765
Poirier Control Company 725
Powell Valves
Pusey & Jones Corp., The 747
Charles P. Raymond Service, Inc.
Rogers & Co., Samuel C. 787
Scapa Dryers, Inc.
Shuler & Benninghofen 781
Signode Steel Strapping Co. 724
Sirrine Company, J. E.
Smidth & Co., F. L.
Spraying Systems Co.
Sprout, Waldron & Co., Inc. 716
Staley Mfg. Co., A. E.
Standard Oil Co. (Indiana) 752
Stebbins Engineering & Mfgr. Co.
Stickle Steam Specialties Co.
Tennessee Corporation 771
Texas Gulf Sulphur Co.
Torrington Company, The 714
Union Asbestos & Rubber Co.
Valley Iron Works Company 774
Vanderbilt Co., R. T. 718
Waterbury Felt Company
West Bend Equipment Corp.
Weyerhaeuser Timber Co. 713
Williams-Gray Company
Wolferz Alloy Equipment, E. C.
Yarnall-Waring Company

HANCHETT TRAVELLING WHEEL TYPE **KNIFE GRINDER**

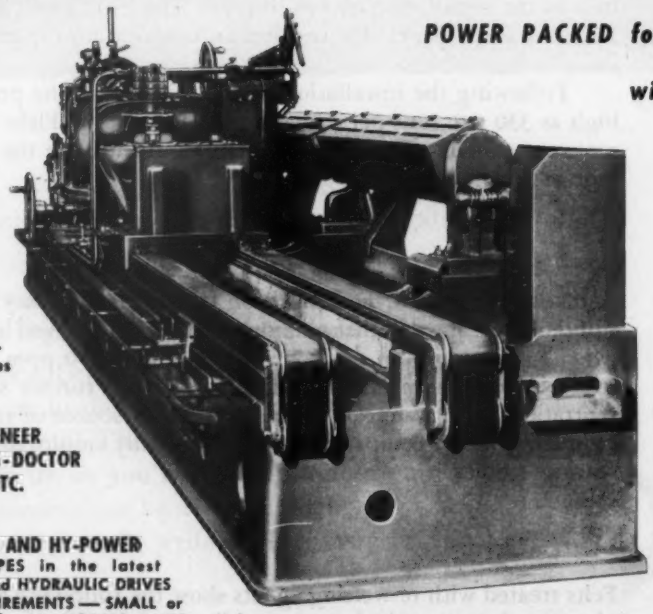
MODEL AK AUTOMATIC

EXTRA HEAVY DUTY

SPECIFICATIONS

Capacity—84" to 396" lengths; Motors — 7½ to 40 H.P., Balanced; Drives — Mechanical - Hydraulic; Speeds—10' to 150 ft. per min.; Wheels—16"-20"-24" Dia.; Types — Cylinder - Segmental; Bearings — 100% Ball and Roller Types

FOR CHIPPER-HOG-PAPER-VENEER KNIVES-ROTARY CUTTERS-DOCTOR BLADES-SHEAR BLADES-ETC.



Built by Master Craftsmen

POWER PACKED for HIGH PRODUCTION with PRECISION ACCURACY

SMOOTH RUNNING
QUIET
VIBRATIONLESS

WE GUARANTEE

1 — More and Better Knives for Less
2 — Finer Finishes with Greater Accuracy
3 — Cleaner Cut Material
4 — Reduced Knife Costs
5 — Longer Knife Life with Less Changes

Send Us Your Knife Problems

OTHER MODELS - DN - GK AND HY-POWER TRAVELLING TABLE TYPES in the latest MECHANICAL-ELECTRIC and HYDRAULIC DRIVES to meet ALL KNIFE REQUIREMENTS — SMALL or LARGE from 32" to 240" with MOTORS 3 H.P. up to 75 H.P.

HANCHETT MANUFACTURING COMPANY

Main Plant BIG RAPIDS, MICH.
West Coast PORTLAND (1) OREGON

Savings resulting from the installation of bark burning equipment

According to Joseph Rockley, chief engineer of Anglo-Newfoundland Development Co. Ltd., the total approximate cost of steam generation with bark burning equipment is 29-51c per 1000 lb./steam at 1,000,000 lb. steam generation per day (the lower figure is regarded as the more realistic). The wide range of this estimate is due to labor costs, based on the requirement of four operators per shift for bark handling regardless of the quantity of bark produced.

Comparing this with the cost of Bunker "C" oil amounting to 65c/1000 lb. of steam, bark burning may result in a saving of 36c/1000 lb. of steam.

Capital investment requirements in new bark burning equipment was given as: $84,100 for the proportioner, stokers, fans, etc.; $6,800 for controls; $15,300 for conveying equipment; and $10,300 for electric motors, switch gear, wiring and primary equipment.

A third press on a pulp machine

The drying capacity of a pulp machine was increased at KVP Co.'s Espanola mill by the installation of a third press. The Flakt dryer is designed to handle 250 tons of pulp per day and has an evaporating capacity of 11,600 lb. per hour.

Following the installation of the third press, the production has run as high as 330 a.d. tons per day, the pulp leaving the Flakt dryer at 25 per cent moisture content. The a.d. tests of the pulp leaving the third press were as high as 56.5 per cent.

Spent sulfite liquor — a source of food for free swimming oyster larvae

A report by Prof. R. E. Dimick on the oyster bio-assay studies using spent sulfite liquor, showed that no mortalities were observed in market size oysters when subjected to an environment containing 50 ppm spent sulfite liquor over periods ranging from 74-150 days. It was further shown that SSL concentration of 75 ppm can actually serve as a source of natural food for free swimming larvae comparable to that normally employed in laboratory larval rearing studies.

Advantages of chemical felt conditioning

Felts treated with re-wetting agents show the following advantages: (1) running size is approached more rapidly; (2) the danger of snagging (before felts reach width equilibrium) is lessened; (3) puckering, as a result of uneven wetting out, is reduced; (4) felt nap packs down more rapidly; (5) less "blowing" is observed while felts are breaking in; and (6) felt guides function more quickly.

If

you are making
a filled sheet—and

you would like to increase
the ash content, opacity
or brightness of your
finished paper without
increasing your usage
of fillers—or

you want to maintain
your present standards
while reducing usage
of clay and pigment—

THEN • • • we suggest you investigate the use of DARLING'S IMPROVED BONE GLUE as a wet end additive.

We've learned that every paper mill, including your own, is "different." That's why a cooperative mill trial is the best way to get a technical and economic evaluation.

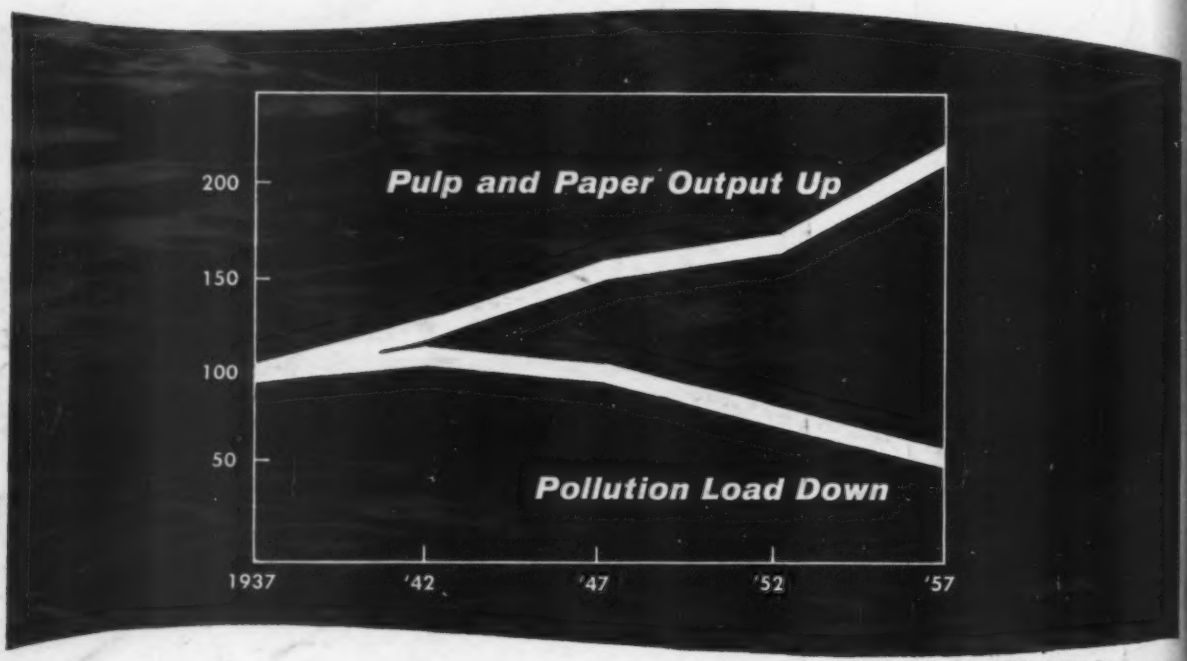
Our Technical Service Representative would like to work with you in determining what can be accomplished in your mill. The cost of the glue and technical service are on us, so you've nothing to lose—much to gain. Arrangements can be made through your Darling Sales Representative. Or write, call, or wire us direct.

DARLING & COMPANY
GLUE DIVISION
4201 South Ashland Avenue • Chicago 9, Illinois

DARLING'S improved BONE GLUE

Reduce filler and fiber loss

...minimize stream pollution



Source: National Council for Stream Improvement (of the Pulp, Paper, and Paperboard Industry).

For your "white water" treatment program use these General Chemical products:

ALUMINUM SULFATE

SODIUM SILICATE

CHROME ALUM

SULFURIC ACID

Self interest and the public interest are one and the same when it comes to treating "white water." Chemical treatment with appropriate coagulation chemicals pays off in important savings through recovery and re-use of filler and fiber . . . stream pollution is minimized by delivering a clearer effluent.

For the chemicals you need in your "white water" treatment operations, call on General! General Chemical has served the paper industry for over 50 years . . . is a leading producer of Alum and many other water-treatment chemicals. Producing works and stock points from coast to coast are geared to meet your needs efficiently and quickly. That's why General Chemical is your *best* source of supply. Experienced technical service is always readily available. For further information, just write or phone our nearest office.

Basic Chemicals for American Industry

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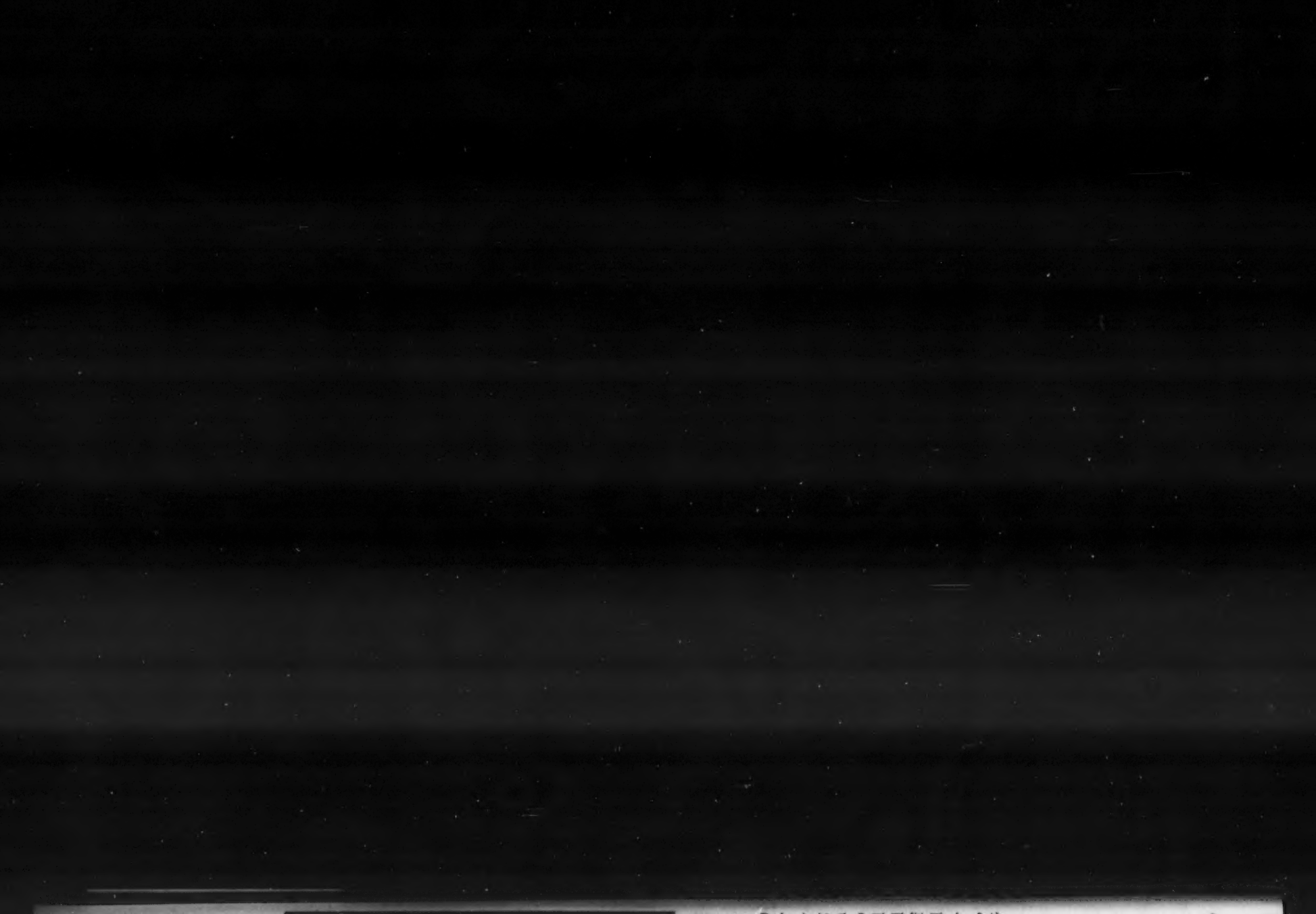
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